

# INPUT<sup>®</sup>

## Systems Integration Program

### Vendors

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- Competitive Structure
- Comparative Analysis
- Vendor Profiles
- Questionnaires

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# U.S. SYSTEMS INTEGRATION VENDOR ANALYSIS

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*Systems Integration Program*

*U.S. Systems Integration Vendor Analysis*

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## Abstract

This report focuses on the vendors in the systems integration market in the U.S., based on 1990 revenues and organizational structures. Once viewed as part of professional services, systems integration is now recognized as a significant channel for products and services from other parts of the information services industry as well, and has emerged as a major delivery mode.

This report is based in part on a definition of SI that emphasizes the integrator's role in providing overall management of the contract, serving as the single point of contact with responsibility for the business functions, performance, schedule, cost, and final delivery of the system.

The report provides a comparative analysis of the structure, business objectives, organization, financial characteristics, strategies, market focus, and capabilities of the leading SI vendors. It also compares results from INPUT's most recent survey to the results of an earlier survey, whenever possible, to identify trends and shifts in strategy that are occurring in this market. Conclusions are drawn about the likely evolution of the market over the next five years.

This report contains 352 pages and 217 exhibits. It was prepared as part of INPUT's Systems Integration Program.

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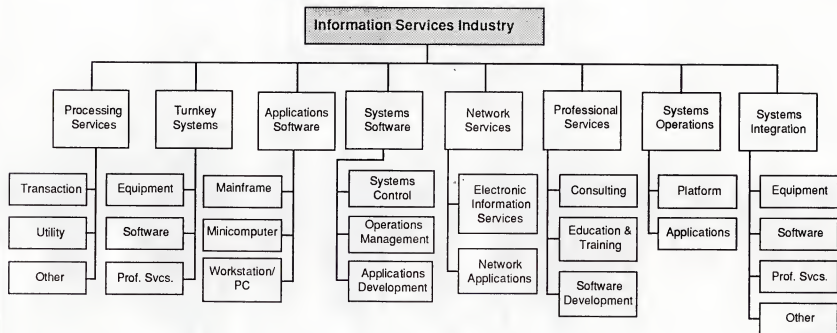
## Introduction

The opportunities for systems integration (SI) have encouraged vendors in virtually all segments of the information services industry to either enter or increase their participation in this growing market. They have also been encouraged to assess their competitive position and find ways to increase market penetration. Though corporations are buying more information systems hardware and services under the umbrella of SI contracts, they are doing so at a slower pace than in past years because of the recession. The economic slowdown has resulted in a decrease of orders and a lengthening of project cycles.

Despite the temporary slowdown, SI market growth continues, strengthening a fundamental change in the industry that will continue to have broad-ranging impacts. To examine the phenomenon, INPUT has conducted research on the nature of SI projects, buyer issues, and vendor approaches to systems integration. In 1987, INPUT developed its first market forecast for SI, and currently includes systems integration as a major delivery mode in its information systems market forecasts. Exhibit I-1 shows the positioning of the market relative to other delivery modes in the information services industry.

This report focuses on the current responses of the vendor community to systems integration as a complement to traditional markets and as an opportunity for accelerated growth. It examines the emerging vendor responses to what INPUT believes to be a user-driven phenomenon and considers the positioning of major contenders in the marketplace.

## Information Services Industry Structure—1991



Source: INPUT

**A****Objectives**

The primary objective of this report is to present a current and accurate analysis of the competitive structure of the market for systems integration services and a forecast of trends that will influence the market over the next five years. The report contains detailed discussions on:

- The strategies and positions of leading vendors in the systems integration marketplace
- The growing list of emerging vendors and their views on their position in the market
- The fundamental impact SI is having on the more traditional information services delivery modes
- The likely scenario for development of the competitive structure of SI services over the next five years

In addition to the primary objective, there are several secondary objectives, summarized in Exhibit I-2. They are:

- To examine the fundamental driving forces in the buyer/user community that underlie the rapidly growing demand for SI services
- To clarify the definitions used in describing the market and the competition
- To establish a framework for classifying systems integration vendors, for the purpose of comparison
- To examine the emerging role of alliances in the systems integration marketplace

**EXHIBIT I-2****Secondary Study Objectives**

- Examine user driving forces
- Clarify market definitions
- Examine emerging role of alliances

**B****Scope and  
Methodology****1. Scope**

This report focuses on the domestic U.S. commercial SI market. However, due to the nature of the market and competition, there is information presented that reflects developments in the federal market and, to some extent, Canada.

1990 information on revenues and markets was used wherever possible. In some instances, 1989 data was used when 1990 financial information was unavailable. Similarly, INPUT adjusted some vendor information when it was necessary to obtain comparisons within a common set of definitions. All of the other (non-financial) information utilized in the analysis was obtained in the period from mid-1989 to early 1991 and, therefore, reflects the most recent data available.

**2. Methodology**

Information used in this analysis was obtained from three primary sources and a number of secondary sources. The primary sources of information are described below.

- In-depth interviews were conducted with 24 firms. Key contacts at each vendor site were identified, and a questionnaire (Appendix A) was mailed to the interviewee. The questionnaires returned by interviewees were clarified and/or completed over the telephone. Data from this survey was utilized in the competitive analysis and to develop individual vendor profiles.
- INPUT's annual vendor survey also provided significant data for the study. Each year INPUT surveys approximately 950 companies in the information services industry. 1989 revenue data collected on SI vendors, vertical markets, and professional services was utilized in analyzing SI competitive trends.
- Each year INPUT surveys approximately 250 of the Fortune 500 information systems executives on budgets, issues, technology, and trends. In the 1990 survey, information specific to the use of outside services and systems integrators was collected, and has been utilized in the systems integration competitive analysis.

In addition to these primary sources, some secondary sources of information were utilized in the analysis. These are summarized in Exhibit I-3.

Most of the data collected from the vendor surveys was tabulated, and individual vendor profiles were prepared using all data sources.



## EXHIBIT I-3

**Secondary Information Sources**

- Vendor-provided publications
- INPUT's 1990 market forecast
- INPUT's proprietary vendor files
- *U.S. Systems Integration Markets, 1990-1995\**

\* INPUT report

**C****Report Structure**

The remaining chapters of this report are organized as follows:

- Chapter II, Executive Overview, provides a summary of the contents of the entire report.
- Chapter III, Competitive Structure, presents INPUT's analysis of the overall market structure and an assessment of how the systems integration market is evolving. This chapter also contains an analysis of the factors that appear to be motivating various classes of SI vendors.
- Chapter IV, Comparative Analysis, focuses on how the various market participants compare in areas such as strategy, organization, capabilities, and offerings.
- Chapter V focuses on the individual participants in the market. A total of 24 vendor profiles are presented.
- Chapter VI presents INPUT's summary and conclusions.
- Appendix A contains the vendor questionnaire used to obtain the primary research information used in the report.

**D****Related INPUT Reports**

Recent INPUT reports relevant to the systems integration area include:

- *U.S. Systems Integration Markets, 1990-1995*
- *U.S. CIM Systems Integration Market, 1990-1995*
- *Network Integration—A Growing Market*

- *Program Management in Systems Integration*
- *Electronic Image Processing, 1990-1995*
- *Federal Systems Integration Markets, 1990-1995*
- *U.S. Systems Operations Markets, 1990-1995*

## II

## Executive Overview

This report focuses on the competition in the systems integration market. There seems to be little doubt that a market clearly exists, and is having a fundamental impact on key vendors in the information services industry. The objective of the research and the resulting report is to present a current and accurate analysis of the competitive structure of the market, to analyze the key strategies of the major players, and to identify trends and issues that will impact the positions and strategies of competitors over the next five years.

## A

### Background and Methodology

#### I. Background

INPUT has been examining the development of systems integration as a market for eight years. During that time, a number of research reports were produced (see Chapter I, Section D) that examined the market from buyers' and vendors' perspectives. Until 1987, INPUT tracked and forecasted revenues for systems integration as part of professional services. It then became apparent that SI was a significant channel for products and services from other parts of the information services industry, and was emerging as a major delivery mode within the industry. INPUT now considers systems integration one of the eight major delivery modes in the U.S. information services market and forecasts and tracks revenues for SI in aggregate and across the fifteen major industries shown in Exhibit II-1.

In 1990, systems integration revenues for all industry sectors of the U.S. market reached \$6.4 billion, representing 6.4% of the total U.S. information services industry revenues of \$100 billion. SI is the fastest growing delivery mode in the information services industry, with a forecasted compound annual growth rate (CAGR) of 19% over the next five years.

## EXHIBIT II-1

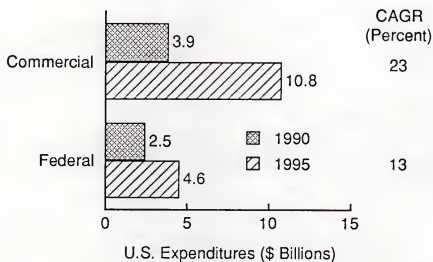
### U.S. Information Services Market Structure

Industry Sectors	
Federal Government	Wholesale Distribution
State and Local Government	Utilities
Discrete Manufacturing	Telecommunications
Process Manufacturing	Health Services
Banking and Finance	Services
Insurance	Transportation Services
Retail Distribution	Miscellaneous
Education	

Exhibit II-2 breaks down the SI forecast into its two major components, federal and commercial. A detailed analysis of all industry sectors is available in *U.S. Systems Integration Markets, 1990-1995*.

## EXHIBIT II-2

### Systems Integration Market Forecast



The federal market is clearly the largest single industry sector at present and, despite its slower growth rate, represents a significant opportunity over the five-year timeframe. The commercial market is much younger; its largest sectors are:

- Discrete manufacturing
- State and local government
- Utilities
- Banking and finance

Since there are some significant differences in how systems integrators conduct business in the two halves of the market, federal and commercial, it is useful to keep this segmentation in mind when analyzing or comparing vendor capabilities.

Finally, it is important to understand that the driving forces stimulating this high-growth market are deep rooted, and are likely to continue in the foreseeable future. They are rooted in the fundamental changes occurring in U.S. business, which include:

- Globalization of markets
- Increasing competitive pressures
- Shortening product and market cycles
- A growing service component of U.S. industry
- Increased acceptance of SI by the user community

These fundamental trends are translating into an accelerated demand to apply information systems technology at the strategic and operational levels to most U.S. businesses in ways not even conceived of a few years ago. As a consequence, many information systems (IS) and other senior executives are turning to systems integrators to provide total solutions in order to cope with the issues summarized in Exhibit II-3.

EXHIBIT II-3

### Major IS Management Issues

- Rising management expectations for IS technology
- User demands for increasingly complex solutions
- Increased need to manage the technology investment
- The need to integrate applications/data/technology
- Mission-critical solutions

## 2. Methodology

To examine how the competition is dealing with the emerging SI market, INPUT conducted in-depth interviews with 23 senior SI vendor executives. All interviews were conducted by senior INPUT personnel. The list of companies is contained in Exhibit II-4. The topic areas are outlined in Exhibit II-5. Since the number of telecommunications companies included in this initial sample was small, additional information from other sources was utilized to support the analysis.

This information was combined with additional research to prepare a set of vendor profiles describing each vendor's general business characteristics and its specific approach to the systems integration market. A set of 24 profiles was released prior to the publication of this report. Additional profiles will be released as they are developed and verified as part of INPUT's Systems Integration Program.

In addition to the profiles, the information gathered in the surveys was aggregated and analyzed to identify trends and issues relevant to the competitive market. The remainder of this chapter summarizes the findings and presents INPUT's conclusions regarding competition in the SI market.

EXHIBIT II-4

### Companies Interviewed

Company Type	Company Name
Equipment manufacturers	IBM, DEC, Unisys Bull HN, NCR
Professional services companies	Andersen Consulting, SHL Systemhouse, EDS, AMS, CSC, CTG, SAIC, Coopers & Lybrand, KPMG, PRC, Price Waterhouse, STM
Communications companies	AT&T, NYNEX
Aerospace companies/other	BCS, Litton, Grumman, McDonnell Douglas

## EXHIBIT II-5

**Interview Subject Areas**

- Background and strategy
  - Skills and capabilities
  - Business objectives
- SI organization/responsibilities
  - Organizational structure
  - Key contacts/number of personnel
  - Centralization of functions
  - Distribution of personnel by skill
- Contract characteristics
  - Mainframe vs. distributed
  - Service components
- Financial characteristics
  - Revenues/margins/profitability
  - Pricing policies
- Strategy and markets
  - Vertical and functional focus
  - Method of prospecting
  - Positioning/promotion
  - Capabilities and products
  - Competitors
  - Alliances

**B****Primary Findings****1. Competitive Structure**

Overall analysis of the data identified several correlations between the classes of vendors listed in Exhibit II-4 and their fundamental approaches to the business.

- Equipment manufacturers have become prime SI competitors in areas where they can apply new technologies, expand markets for these technologies, and leverage existing and new product lines. They focus on utilizing their typically limited professional services resources to maximize the return on their core business products and retain account control.
- Telecommunications companies have adopted a competitive position that is primarily defensive (particularly in view of deregulation, which provides new alternatives to their existing customers), but they also see opportunities in the SI market to expand existing customer applications and acquire new customers. As in the case of computer equipment vendors, the emphasis is on seeking and executing projects that leverage the core business.
- Professional services companies have expanded their skill inventories in order to provide the broader range of professional skills required to win and execute SI projects. They see SI as an opportunity to achieve higher margins than can be obtained by participating as subcontractors. In effect, they see SI as a profitable expansion of their existing offerings through 'solution' selling.
- Aerospace companies, while still mainly focused on the federal marketplace, are attempting to leverage their federal experience in the commercial arena; however, to the degree possible, they are sticking to the larger commercial opportunities with characteristics similar to federal projects and to their own internal business experiences.

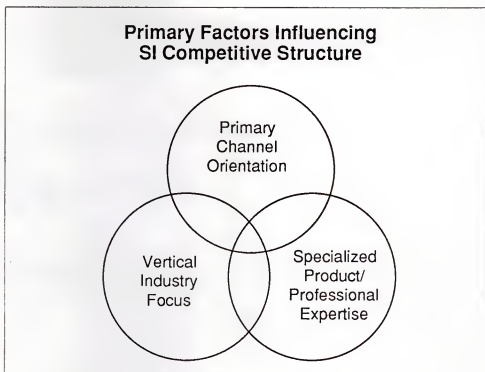
A point that all four classes have in common is that each sees SI as a distribution channel opportunity for its existing lines of products and services.

Other factors that have an effect on market structure are vertical industry focus and proprietary expertise or technology. Almost all the vendors surveyed tended to focus on specific industry sectors. A large percentage also felt that they had particular technologies that could be applied across a number of industries and were focusing on SI engagements in which that expertise or technology gave them a competitive advantage.

In summary, the competitive structure—which tends to dictate which vendors will be competing for certain kinds of projects, as well as the likely alliances—is caused by three primary factors. Assuming that the structure described in Exhibit II-6 is a reasonable representation of the factors at work in a competitive market, then we can expect to see:



EXHIBIT II-6

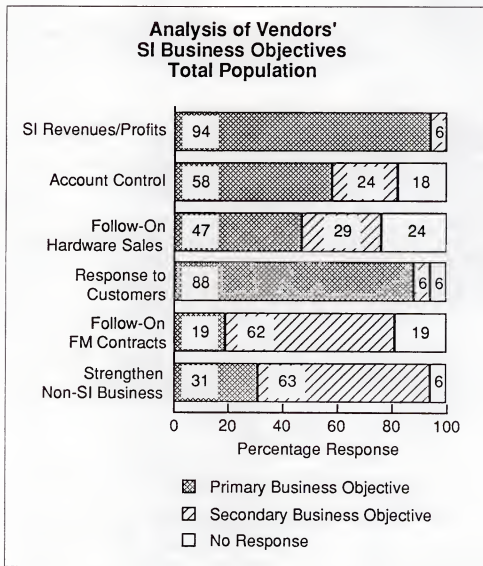


- Strong professional service companies pitted against each other for dominance in particular vertical markets
- Weaker vertical market players seeking alliances with market leaders to maintain some degree of channel control and to earn a reputation in particular industries.
- Continued entrance of niche players with specialized technology or expertise, often as partners to more broadly oriented systems integration vendors.

## 2. Vendors' Business Objectives

The survey examined a number of objectives that vendors might have in the systems integration business. Vendors were asked about their primary and secondary objectives. Exhibit II-7 summarizes the results for all respondents.

EXHIBIT II-7



There were some variations among the classes of vendors in their motives for being in the market.

- Equipment vendors have become more enthusiastic about the potential profit margins of SI activity than in INPUT's earlier analysis, but are still more focused on account control and follow-on sales.
- Professional services companies see SI as a profitable business that meets customers' demands that they provide such services in order to be considered full-service vendors.
- Telecommunications companies, still finding their way in this marketplace, are clearly responding to customer demands and feel that SI may strengthen their non-SI business.

- Aerospace companies are under pressure to diversify from the federal sector, leveraging large blocks of skilled resources into the commercial market where the opportunities are apparently greater. Some of these firms are finding the transition difficult.

The two points that most vendors agreed on were:

- Customers are demanding that vendors be in the business to provide a full range of services.
- Providing systems integration services adds value and, therefore, can result in a more profitable business.

There are no surprises here. Vendors' objectives, as stated explicitly, are clearly consistent with their approach to the market, as discussed in Chapter III, Section B-2.

### 3. Organizational Approach

The majority (71%) of market participants use matrixed organizations to manage their systems integration business.

This is a marked shift from INPUT's earlier analysis, in which only 42% used matrixed organizations. This shift represents a realization by vendors that there are large fluctuations in demand for management and technical skills throughout the life of a systems integration engagement, and that specialized technical skills can be more usefully leveraged through a matrixed organizational structure.

Regardless of organizational structure, responsibilities tend to be divided as follows:

- Centralized management of strategy, planning, contract administration, marketing and acquisition services
- Decentralized control of project execution and implementation, sales, and any follow-on systems operations

INPUT believes that the trend will continue toward more centralized management and control and decentralized execution, as shown in Exhibit II-8.

## EXHIBIT II-8

**Future Organizational Structure of SI Vendors**

- Separate SI organization—division/subsidiary
- Matrixed organization structure
- Increased centralization of:
  - Management, marketing, contract administration
  - Specialized technical/vertical market expertise
- Increased decentralization of:
  - Account management
  - Project implementation

**4. Financial Characteristics**

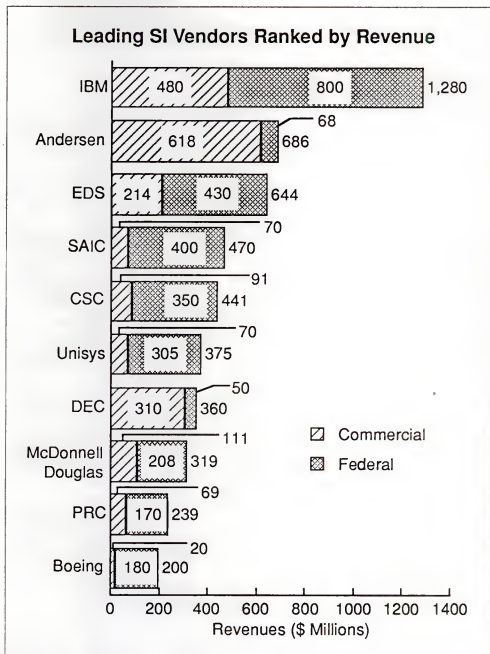
The leading SI vendors are listed in Exhibit II-9, ranked by INPUT's estimate of their total 1990 systems integration revenues. The combined revenues of this group of market participants represent a large percentage of the total market.

As in 1988, the list is dominated by the hardware and traditional federal integrators. With the commercial marketplace growing more rapidly than the federal, and with some federal integrators finding it more difficult than anticipated to move effectively into the commercial environment, this list could change significantly over the next five years. Clearly, the professional services companies are on the upswing, with Andersen Consulting leading the pack. In fact, though INPUT did not include Andersen's hardware pass-through revenues in its total revenues, the company has now become the number two SI vendor.

Analysis of the survey results also identified some other points worth noting:

- Seven vendors reported that margins for their SI operations were increasing, and six indicated they were steady. There is reason to believe that margins are falling in the federal segment of the business. (About 25% of the respondents that participate in the federal business were of this opinion.) Increased competition and pressure on federal budgets were cited as the probable causes.

EXHIBIT II-9



- In general, vendors feel they obtain the highest profit margins on the professional services components of the business, such as consulting, system design and implementation, and project management.

Overall, SI, as a business proposition, looks quite healthy. The market is growing at an overall compound annual growth rate of 19%. Project values have a median value of about \$100 million for federal engagements and considerably less for commercial ones.

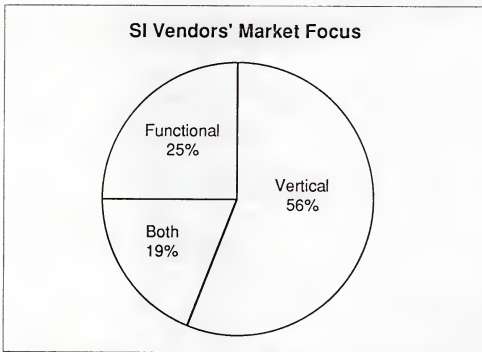
## 5. Strategies and Markets

Vendors indicated that their selection of target markets is based on four criteria:

- Client/project size
- Available in-house skills
- Profitability
- Probability of win

In addition, most vendors focus on specific vertical markets. Seventy-five percent (75%) of the respondents indicated vertical industry sectors as their primary targets. (See Exhibit II-10). Only 25% reported that they were exclusively in functional or cross-industry markets.

EXHIBIT II-10



Consistent with size as the dominant market selection criterion, the primary industries selected by systems integrators, in descending order, are:

- Federal government
- Manufacturing
- Finance and banking
- State and local government
- Distribution

The dominant cross-industry focus was on network integration. Again, this is not a surprising result considering the strong emphasis on connectivity at the applications, data, and infrastructure levels of most systems

integration projects, and the global scope of many of the larger SI clients. In the functional and cross-industry markets, the dominant factor in selecting the target was clearly the vendor's proprietary technology or expertise in a particular area.

As part of the research, vendors were asked to list their primary competitors in the federal and commercial marketplaces. Andersen Consulting and EDS were tied with 11 mentions each. This has changed since INPUT's last survey, when EDS was behind Andersen. IBM held the number two spot in the commercial market, and Andersen was number three in the federal market. This was a large shift for Andersen, which had not been mentioned at all among the federal competitors in INPUT's last survey.

Finally, although most vendors have specific ways they position themselves in their respective markets, it is quite clear that word of mouth and reference selling are still the most effective methods of attracting prospects and winning bids. Nothing sells like a good reputation.

## **6. Capabilities and Products**

The study looked at each vendor's capabilities from four perspectives:

- Overall Capabilities - The business factors and fundamental technical capabilities needed to compete in the marketplace.
- Implementation Skills - An analysis of fourteen specific capabilities, all or most of which are required to implement typical SI projects.
- Alliances - The processes utilized in working with other vendors and the types of relationships used.
- Proprietary Products - Unique technologies, methodologies and processes that a vendor brings to the marketplace.





















### **a. Overall Capabilities**

As was the case with several other aspects of the research, viewing the vendors by the class structure described earlier is useful. For example, if we look at overall capabilities (Exhibit II-11), a number of conclusions can be drawn:

- In general, professional services companies rated themselves highly on their ability to execute projects and manage client relationships. Although they don't generally have the financial capacity that the major hardware and telecommunications vendors do, their ability to handle the overall risk is more than adequate, and their strong vertical industry knowledge works to their advantage, reducing the risk of project failures.

## EXHIBIT II-11

## Overall SI Capabilities by Class

Capability or Skill	Hardware Manufacturers	Professional Services Companies	Telecommunications Companies	Aerospace Companies
Ability to manage risk				
Project management skills				
Technology expertise				
Vertical industry expertise				
Client relationships				



High



Medium



Low

- The aerospace companies have a high degree of comfort in their traditional line of business, the federal market. They have solid project management skills, and have accumulated significant vertical industry expertise. Confidence in the ability to manage client relationships and commercial projects, which generally have less rigidly defined specifications than federal projects, has improved since INPUT's last survey.
- Clearly the equipment manufacturers and telecommunications companies have the capacity to handle risk from a financial perspective. The distinction between the two is that the technical and project management skills of telecommunications companies are highly specific. Their experience at implementing industry-specific computer applications is more limited. They naturally rate themselves as having less vertical industry expertise than professional services firms, and are less sure of their client relationship skills.



**b. Implementation Skills/Alliances**

To further compare the vendors, INPUT analyzed their internal capabilities and use of alliances in each of the 13 specific SI capability and skill categories described in Exhibit II-12.

EXHIBIT II-12

Classification of SI Skills	
Skill Class	SI Capability/Skill
1. Win/control the business	Consulting skills Design methodology Design/integration capability Project management skills
2. Successfully implement	Software development Education/training/documentation Packaged systems software Standard computer hardware Customized computer hardware Communications hardware
3. Support and service	Network management capability Service and repair capability Software maintenance services

The primary conclusions are:

- Overall, traditional professional services firms dominate in those skills and capabilities necessary to win and control the business in the commercial market, with equipment manufacturers in second place.
- All four classes have more than adequate capabilities to implement, assuming they don't undertake projects beyond the scope of their technical capability (whether housed internally or provided through alliances).
- Depending on the individual vendor's strategies, each is equipped to deal with support and service, though professional services firms have a strong tendency to use alliances to acquire these skills.

### c. Proprietary Products

Over 80% of the vendors indicated they had proprietary products that gave them leverage in the systems integration business. The three most dominant types were project management and CASE tools, and industry-specific software. Connectivity products, data and network management technology, and unique hardware products were also cited. INPUT believes that proprietary technologies will become a significant differentiating factor as the market matures.

### 7. Overall Evaluation

Exhibit II-13 combines all the comparative data by vendor class. Admittedly, the judgments required to construct the exhibit are, at best, subjective. The variety in the portfolio of existing and potential SI projects, individual vendors' capabilities and experience, and the immaturity of the market all work against the construction of a model that could be used by an individual vendor as a blueprint for success. However, the exhibit does provide some insight into the behavior and strategies of vendors in particular classes, and is useful when comparing individual company profiles to others in the same class.

EXHIBIT II-13

#### Overall Vendor Comparison by Class

Capability or Skill	Hardware Companies	Professional Services Companies	Telecommunications Companies	Aerospace Companies
Market Share				
Commercial				
Federal				
Vertical industry expertise				
Ability to manage risk				
Internal capabilities, products, alliances				
• Win/control the business				
• Successfully implement				
• Support/service				
Client relationships				

Strong   Average   Weak

**C****Trends and Issues**

If we consider the information presented in Section B the “state of the industry,” what issues and trends are likely to have an impact on competition over the next several years? Several were identified as a result of this research, and are summarized in Exhibit II-14.

EXHIBIT II-14

**Issues and Trends****Trends**

- Movement to full-service capability
- Growing importance of technology
- Increase in number of mergers/acquisitions
- Inclusion of network management component

**Issues**

- In-house competition
- Project failures

- The majority of vendors are moving toward building in-house, full-service capabilities that will support their individual market strategies. This is a general trend in the information services industry, documented by INPUT's Annual Industry Survey. However, the motivation to move in this direction is particularly evident in companies competing in the systems integration market.
  - Alliances are useful, but have potential future problems in the form of competition or loss of proprietary technologies.
  - Integrators would prefer to bring as much of the available revenue and profit in house as possible.
- Vendors are also stepping up efforts to develop or acquire unique technologies and methodologies that will leverage their market position by:
  - Allowing them to be more competitive in the design and implementation process
  - Giving them a particular advantage in a target vertical industry application
  - Providing connectivity at the applications, data, or network level

Although individual technologies are in general not a differentiating factor today, they are likely to become so in the future.

- These two trends are generating a third—a significant increase in the number of mergers and acquisitions by systems integrators.
- The increased emphasis on incorporating a network component into many SI engagements reflects the increased globalization of U.S. industry and the difficulty companies have in acquiring necessary communications technology skills.

In addition to these major trends, there are at least two key issues affecting SI competition that seem to be emerging as the market matures:

- In the past, a number of major SI projects failed or faced significant cost and/or schedule overruns. Though there seem to be fewer of these failures now, integrators must be prepared to deal with the market and financial impacts of out-of-control projects.
- Some internal information systems functions are adopting the methodologies and approaches used by systems integrators. The result could be increased internal competition, and we have already seen the entry of some of today's "buyers" into particular market niches. Tightening IS budgets may also cause IS organizations to use their internal skills more often.

## D

### Conclusions and Observations

Many of the conclusions have been presented in previous sections. This section provides some additional thoughts.

**Driving Forces:** Based on INPUT's buyer research and the survey work done for this report, it is quite clear that there are four forces driving the competition in the systems integration marketplace:

- Customer business needs for increasingly complex applications of technology to mission-critical systems
- The availability of applications enabling newer and more cost-effective technologies
- Lack of the specialized in-house expertise or a shortage of in-house professional services staff required to rapidly and effectively deliver the complex technology-based solutions being demanded
- The channel opportunities that systems integration services can provide to vendors for their primary products and services

**Vendor Response:** The various classes of systems integrators have responded to these driving forces in somewhat different ways. However, regardless of the origins of their primary businesses, virtually all vendors present themselves to the market as providing full solutions to customers' business problems.

**Financial Characteristics of the Market:** The market appears to be very healthy. The SI market is experiencing rapid revenue growth (23% CAGR), and all vendors interviewed for this report indicate that their SI commercial margins are improving or remaining stable. INPUT believes vendors will be able to continue to get high margins for the professional services components of their SI business, but will need to step up investments in CASE and other technology projects to hold onto those margins as competition increases in the industry.

**Market Strategy:** The majority of market participants have adopted a vertical industry approach to the market. Since most potential clients are attempting to buy solutions that are specific to various industries, this appears to be the most effective approach. INPUT believes, however, that opportunities will continue to exist for vendors whose primary capabilities are specialized technologies or cross-industry applications. Furthermore, cross-industry vendors working as allies of firms that have significant strengths in vertical sectors can expand the number of opportunities available to them.

**Capabilities and Products:** To provide a technology-based full solution to a buyer's specific business problem, the integrator must have a significant variety of technical expertise and other resources at its disposal. Even the largest vendors lack, or are weak in, selected capabilities or products and have relied heavily on alliances to fill in the gaps. INPUT believes that in the future, the tendency will be to plug those gaps by building internal expertise and/or acquiring firms or products. The result could be a smaller number of larger firms in the market over the next five years.

**Conclusion:** The competitive market for systems integration is clearly dynamic. As the market matures, new players will continue to enter the competition and older ones will adjust their in-house capabilities to meet the critical skill requirements and changing market demands.





## Competitive Structure

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The highly customized nature of systems integration projects, and the blurred definition as to what is and is not a systems integration activity, conspire against a clear definition of the market. Furthermore, the large number of projects of varying sizes, the dominance of a few vendors, and the difficulty of obtaining accurate and detailed information on projects make any meaningful mathematical analysis of structure all but impossible. However, as a result of this research and INPUT's analysis of over 600 SI projects in its SI Project Data Base, it is becoming apparent that there are some consistent relationships between classes of vendors and the nature of the projects sought and undertaken that provide a framework for a competitive structure. For example:

- Equipment manufacturers have become prime SI competitors in areas where they can apply new technologies, expand markets for these technologies, and leverage existing and new product lines. They have been most successful within their own client bases. They utilize their typically limited professional service resources to maximize the return on their core business products, as well as retain account control.
- Telecommunications companies have adopted a defensive competitive position, particularly in view of deregulation, which provides new alternatives to their existing customers. However, they also see opportunities in the SI market to expand existing customer applications and to acquire new customers. As do computer equipment vendors, telecommunications companies seek and execute projects that leverage, as well as protect, the core business.
- Professional services companies have expanded their skill inventories in order to provide the broader range of professional skills required to win and execute SI projects, and see SI as an opportunity to achieve higher margins than can be obtained by participating as subcontractors. In effect, they see SI as a profitable expansion of their existing offerings through solution selling.

- Aerospace companies, while still mainly focused on the federal marketplace, are attempting to leverage their federal experience in the commercial arena; however, to the degree possible, they are sticking to the larger commercial opportunities that have characteristics similar to federal projects and to their own internal business experience.

## A

### Primary Findings

#### 1. Competitive Structure

In essence, the various market participants see SI as a distribution channel for their more traditional lines of business. This is clearly the most dominant influence on the competitive structure of the market. Furthermore, because vendors view SI as a required channel for meeting their customers' requirements and leveraging their existing lines of business, they often tune the definition of SI to satisfy those ends.

Vertical industry segmentation and proprietary expertise in the application of specific technologies are the other two factors that are influencing the market structure.

- Vertical Industry Segmentation - Almost every SI vendor surveyed either already had a vertical industry strategy or felt the need to develop some vertical orientation in order to be successful in the business.
- Application of Specialized Technologies - Although less dominant than vertical industry segmentation, a number of vendors see the application of proprietary or specialized technologies as an opportunity to capture specific SI market niches.

These three primary factors, summarized in Exhibit III-1, give considerable insight into who is likely to be competing with whom on what kinds of projects.

#### 2. Competitive Segmentation

Based on the overall observation of the responses to the 17 vendor surveys, for certain aspects of the analysis it is useful to segment the population of respondents by the nature of their core businesses. The segmentation by four major classes and the name of each company surveyed by class is contained in Exhibit III-2, and is based on the following observations:

- The equipment manufacturers were consistent in their responses on the majority of issues examined in the study, and clearly are motivated to be in the market for the same reasons.



## EXHIBIT III-1

### Primary Factors Structuring the SI Market

1. Vendor channel orientation
2. Vertical market focus/expertise
3. Application expertise in specialized technologies

## EXHIBIT III-2

### SI Respondent Demographics/Classification

No.	Companies	Classification
4	Hardware manufacturers	IBM*, DEC, Bull, NCR
9	Professional services companies	
3	Consulting based	Price Waterhouse, Coopers & Lybrand, KPMG Peat Marwick
1	Systems operations	EDS*
5	DP professional services	AMS, CSC, PRC, SAIC, STM
2	Communications companies	AT&T, NYNEX
2	Aerospace companies/other	Grumman, McDonnell Douglas

\* Indicates separate interviews for federal and commercial

- Accounting/consulting companies, traditional facilities management firms, and companies whose primary strength has been in custom software implementation (data processing professional services companies such as PRC) also responded similarly to most aspects of the survey. Therefore, for certain elements of the analysis, their responses have been grouped in the professional services category.

- Telecommunications companies, although similar to the hardware manufacturers in many of their responses, warrant a separate category. In general, their experience in systems development and implementation is weak, and they have been late in formulating strategy and entering the market.
- Finally, the aerospace companies want to leverage their experience in the large federal market into a faster-growing and somewhat different commercial environment. Some have failed, but others continue to attempt this transition.

This segmentation will be used throughout the remainder of the report whenever it enhances insight into the analysis.

## B

### Vendor Market Share

To gain insight into the competitive environment in the systems integration market, it is helpful to look at the revenue distribution of the 10 top SI vendors and examine how their revenue is distributed. Together, they represent 79% of the market. Exhibit III-3 ranks the vendors and indicates the percent of their revenue that is derived from the federal and commercial markets. The data used in this analysis, both for revenue and distribution, is the vendors' 1990 systems integration revenues.

The market leader, IBM, derived 63% of its revenue from contracts with the federal government. The remaining 37% of its revenue is spread rather evenly across a wide range of vertical industry markets. Andersen Consulting, by contrast, derived only 10% of its SI revenues from the federal market, but has a strong presence in the manufacturing and banking markets.

EDS conforms to IBM's pattern, with 67% of its business in the federal market and the balance of revenue being derived from the major vertical industry markets.

In fact, the next three vendors exhibit the characteristically high percentage of federal revenue typical of systems integration vendors at this stage of the market's life cycle. These vendors are either not trying to penetrate the commercial market or have only begun their diversification efforts. DEC is a much broader based SI vendor, with revenue from all the major vertical markets, much like Andersen Consulting.

EXHIBIT III-3

**Top SI Vendors—1990**

Vendor	Revenue Split (Percent)	
	Federal	Commercial
IBM	63	37
Andersen	10	90
EDS	67	33
SAIC	85	15
CSC	79	21
Unisys	81	19
DEC	14	86
McDonnell Douglas	65	35
PRC	71	29
Boeing	90	10

Note: Vendors are ranked in decreasing order of total market share.

Exhibit III-3 illustrates how most SI vendors' business has evolved. Most of them started from a strong base of federal systems integration experience. Many are leveraging this, as well as their presence in other markets as vendors of other products or services, to build their systems integration engagements in those markets. The exceptions to this rule—DEC and Andersen Consulting—started from an existing presence in a number of markets and built their SI penetration on the basis of particular industry knowledge.

Another useful analysis is to identify the top five vendors in each of the top five vertical industry markets. Exhibit III-4 shows this ranking.

IBM's dominance in the federal and state and local markets is evident, though EDS is also a strong player. Martin Marietta, CSC, and SAIC are tied with one another in the federal market. They change positions from year to year because the large contract values of any single contract in the market can vault one vendor up in the standings.

## EXHIBIT III-4

## Vertical Markets—Top Vendors

Vertical Market	Vendor by Rank/Revenue				
	1	2	3	4	5
Federal	IBM	EDS	Martin <sup>(T)</sup>	SAIC <sup>(T)</sup>	CSC <sup>(T)</sup>
State/Local	IBM	EDS	CSC	Unisys <sup>(T)</sup>	Andersen <sup>(T)</sup>
Banking/ Finance	Andersen	IBM	DEC	AMS	EDS
Manufacturing	Andersen	McDonnell <sup>(T)</sup>	IBM <sup>(T)</sup>	EDS	DEC
Insurance	Andersen	EDS <sup>(T)</sup>	DEC <sup>(T)</sup>	IBM	CSC

Note: (T) = Tied

The state and local market is dominated by IBM and EDS also, but the next few players are different from those in the federal market. Apparently, success in the federal market is not necessarily translatable into success at the state and local levels.

Andersen is first in the banking and finance market, but IBM is a strong second. DEC is a surprisingly strong player here, and AMS appears to have a large presence in this market, too. EDS rounds out the top five for 1989, but can be expected to move up because of its systems operations activity in this market.

Andersen also stands out in the manufacturing market. For purposes of this analysis, discrete and process manufacturing have been combined. McDonnell Douglas tied IBM in this sector, and EDS is fourth only because the internal GM business is not included. DEC, at number five, has traditionally been a strong presence in the manufacturing market among the equipment vendors and is leveraging this in the SI market. The manufacturing market contains strong players who are committed to increasing that base.

The insurance vertical industry market is much smaller, but is dominated by some of the major players. For example, IBM has done both the USAA and Lincoln National imaging jobs, and CSC and EDS have several claims processing contracts.

**C****Vendor Driving Forces**

To gain an understanding of the forces influencing various vendors in the SI marketplace, INPUT examined the question from two perspectives:

- The vendors' interpretation of trends and issues in the user environment that are stimulating the market for SI services.
- The resulting business objectives for vendors participating in the market.

**1. User Trends and Issues**

To examine user trends and issues, respondents were asked to simply list trends and issues that were motivating the buying community. No effort was made to rank the responses. A total of 57 responses resulted. In order to analyze the results, common responses were grouped together and classified according to the following scheme:

- Technology (T)—for responses where the primary area of concern was the application of new technology, or the deployment of existing technologies in new application areas.
- Business (B)—for responses that implied a need to use information technology to provide primary support to external business strategy or internal operating improvements.
- Personnel (P)—for responses indicating either a lack of internal skills or inadequate capacity to deal with integration requirements internally.

The results of this tabulation process are presented in Exhibit III-5, with the issues/trends ranked by their frequency of mention.

## EXHIBIT III-5

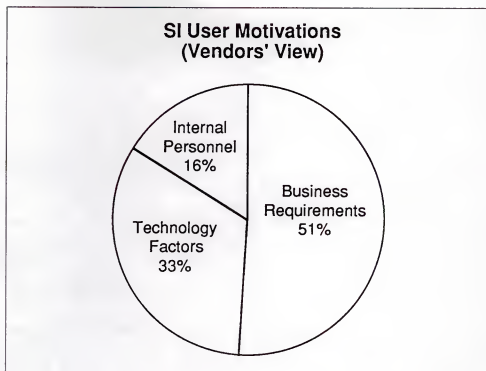
**Vendor Perceptions of User Issues and Trends**

Number of Mentions	User Issue/Trend	Code
9	Lack of user skills	P
8	Size and complexity of project	T
6	Risk management	B
4	Availability of new technologies	T
4	Need to support business integration	B
4	Integrate multivendor environments	T
4	Response to changing business conditions	B
3	Globalization of business	B
3	Movement to end-user computing	B
3	Need for open systems	T
3	Improve productivity	B
3	Greater client receptivity to SI	B
2	Lower-cost solution	B
1	Reduce asset requirements	B

T = Technology, P = Personnel, B = Business

Exhibit III-6 presents this same information, according to the classification of the trends/issues; it shows that the vendor community in general recognizes the primary user motivators for systems integration are business reasons, followed closely by the need to introduce new or integrate existing technologies.

## EXHIBIT III-6



When comparing these responses to those obtained during INPUT's last survey, there is a marked increase in responses relating to business requirements (from 40% to 51%), and a decrease in technology and internal personnel factors. Vendors perceive users as being motivated by business issues more frequently than technical or personnel reasons, when turning to a vendor for systems integration. Vendors are now more aware that they must stress the business reasons of the proposal and place less emphasis on its technological merits. Other buyer-focused surveys conducted by INPUT had shown this same strong concern for business issues; now vendors are also attuned to it.

## 2. SI Vendor Business Objectives

With these perceptions of why the user is motivated to use systems integration, vendors have adopted various strategies for approaching the market. Individual company strategies and business objectives are discussed in Chapter V of this report containing SI vendor profiles. When the entire survey population is examined, there are a number of general conclusions that can be drawn.

As part of the survey, vendors were asked to rank a set of SI business objectives as (P) primary or (S) secondary reasons for participating in the market. Respondents were also given the opportunity to supplement the list with reasons they felt should be included, although none elected to do so. The list of objectives included:

- Strengthen non-SI business
- SI revenues and profits
- Account control
- Follow-on hardware sales
- Response to customer demands
- Follow-on facilities management/systems operations opportunities

Exhibit III-7 expresses the results of tabulating the responses from the 17 surveys. Exhibit III-8 expresses the results broken down by the industry classifications established in Section A. A number of conclusions can be drawn from the results, even though the sample is small.

EXHIBIT III-7

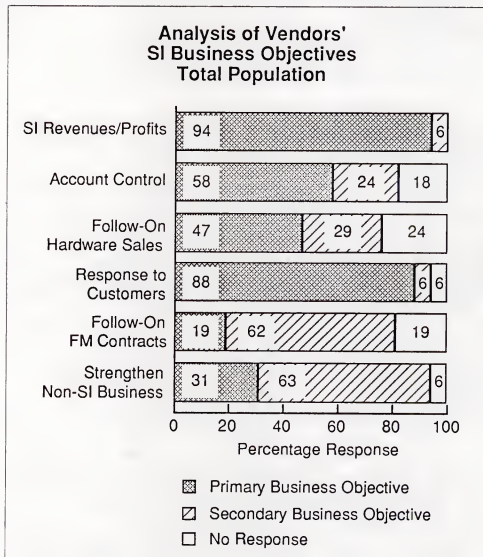
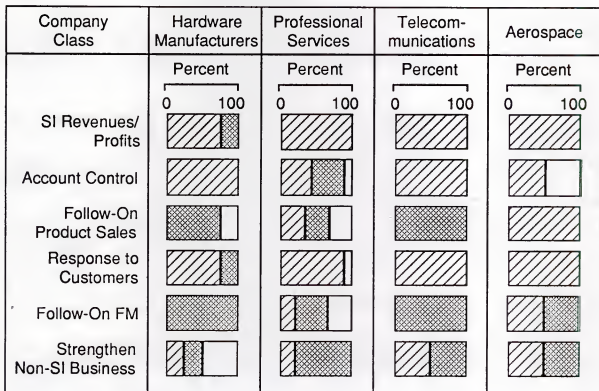




EXHIBIT III-8

## Analysis of Vendors' SI Business Objectives by Company Class



- ☒ Primary Business Objective  
☒ Secondary Business Objective  
☐ No Response

- All but one vendor surveyed saw direct profit and revenue opportunities from a systems integration product offering as a primary objective for being in the business.
- For most companies, response to customer demand was considered a primary factor for being in the SI business. In other words, user demand for a full-service approach is strong enough that vendors simply cannot afford *not* to be in the business, regardless of the origin of their primary line of business.
- Likewise, equipment manufacturers, as do telecommunications companies, see account control as a significant reason for being in the business. In other words, those in the market with "hard" products to sell are strongly motivated to participate in the systems integration market in order to maintain control of the channel.

- Responses to “strengthening non-SI business” indicated that this is really a secondary rather than a primary motivation for those vendors.

## D

### Conclusions

INPUT believes the three primary factors that currently determine the competitive structure of the SI marketplace are:

- The strong channel orientation of the vendors, which is reflected in their SI business objectives, and impressions of the user issues that can be addressed by systems integration.
- Vendors’ capabilities of providing solutions in particular vertical markets.
- Vendors’ availability of specialized products or internal expertise that permits them to take a leadership position in the application of a particular technology or in a cross-industry market.

With these concepts in mind, we can anticipate a competitive structure in the immediate future that:

- Pits strong professional service companies against each other for dominance of particular vertical markets.
- Forces weaker vertical market players to ally with professional services companies to maintain some degree of channel control, to participate and learn, and to develop a track record in key vertical industries.
- Allows for the continued entrance of niche players with specialized technologies or cross-industry expertise, generally in partnership with established SI firms.



## Comparative Analysis

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Chapter V will discuss each vendor in depth. This chapter compares the vendors on a variety of points, including:

- Organization/responsibilities
- Financial characteristics
- Strategies and markets
- Capabilities and products

Exhibit IV-1 presents the detailed demographics and classification of the companies interviewed for this research. A total of 17 companies were studied. Exhibit IV-1 shows how the companies were distributed across the various types of vendors.

EXHIBIT IV-1

### Distribution of Respondent Interviews

- 4 Hardware manufacturers
- 9 Professional services companies
  - 3 Consulting based
  - 2 Systems operations/facilities management
  - 4 DP professional services
- 2 Communications companies
- 2 Aerospace companies

It is interesting to note that, collectively, these companies claim to have a total of 125 years of experience with commercial projects, and 187 years in the federal marketplace. On the average, this works out to about 7 years of commercial experience and 11 years of federal systems integration experience for each company. Even more interesting, one respondent indicated it had 35 years of experience in the federal integration market, and another claimed 30 years in the commercial integration market. Although the formal definition of the market is relatively new, many of the competitors have been operating as integrators for quite some time.

**A****Organization/  
Responsibilities**

The organization of the SI product management and delivery function varies significantly among the competitors. However, two structures are dominant: separate divisions and matrixed structures. Only one company indicated it had a separate subsidiary, and the parent company also performed SI using a matrixed organization. Exhibit IV-2 shows the primary split between these two forms among the survey sample.

EXHIBIT IV-2

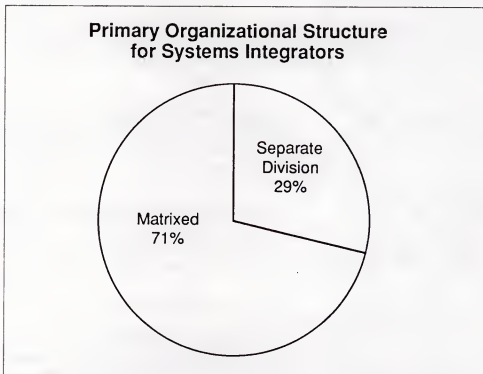
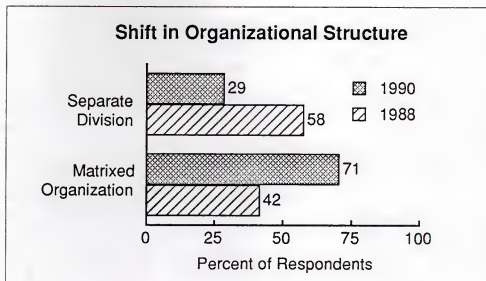


Exhibit IV-3 illustrates how responses compared for 1989 and 1990.

The responses showed a significant change from last year's report, with a strong shift toward matrixed organizational structures. Some of this shift may be attributable to a different mix of companies responding, but INPUT believes there is a realization among integrators that a matrixed organization uses scarce resources more efficiently. It also builds a much closer business relationship with the client when responsibility and resources are geographically close to the customer.

EXHIBIT IV-3



It was clear from examining the data that, even though the organizational approach to support SI tended to mirror the general organizational strategy of the firm, there were some situations where the approach to SI either had evolved or was tending to evolve into a different structure.

- Recent market entrants and organizations with a strong vertical-market focus tended to be highly matrixed.
- Organizations promoting specific technologies and some of the federal competitors tended to be more divisionalized.

### 1. Centralization versus Decentralization

The degree of centralization/decentralization with which various responsibilities are accomplished within these two fundamental structures also provides some insight into how the business is carried out. Exhibit IV-4 summarizes the degree of centralization of eight major business functions of commercial and federal market participants.

A number of conclusions can be drawn from examining the data:

- The top-level management activities—including strategy, planning, marketing, promotion, and contract review and approval—tend to be centralized. This centralization makes sense because of the substantial financial risk associated with most SI contracts.
- Execution of the contracts, including project management, implementation, and systems operations, is done on a decentralized basis, as is account management. These functions involve day-to-day contact with the client and need to be controlled close to the scene of the action.

## EXHIBIT IV-4

**Degree of Centralization of Business Function**

Responsibilities	Number of Respondents					
	Federal			Commercial		
	C	D	B	C	D	B
Contract review and approval	9	4	3	5	6	6
Management strategy and planning	8	2	7	6	3	8
Marketing and promotion	8	1	7	4	5	8
Hardware/software acquisition	7	5	3	6	5	6
Account management and sales	4	9	3	2	13	2
Project management and control	3	11	2	2	12	3
Development and implementation	2	12	2	0	12	5
Systems operations	2	5	4	2	5	5

C = Centralized; D = Decentralized; B = Both

- The hardware/software purchasing function tends to be centralized, because more leverage can be exerted on vendors from a central purchasing authority.

There are some differences in how federal and commercial businesses are handled today. For example:

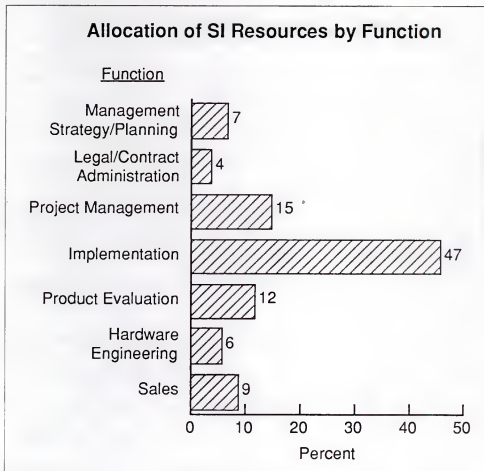
- The higher level of centralization of management strategy and planning, account management and sales, and contract review and approval among federal integrators is most likely attributable to an adversarial environment in that market between vendor and client, larger average contract size, and the geographic concentration of the customers and prospects.

- The greater centralization of marketing and promotion on the commercial side reflects the need to promote SI with other product offerings to a broad range of customers, versus to the single federal customer set.

## 2. Allocation of Resources

As would be anticipated, the bulk of the resources associated with supporting an SI function in the market is allocated to the development and implementation process. The survey data on the percentage distribution of personnel for all major functions is summarized in Exhibit IV-5.

EXHIBIT IV-5



There are some significant variations between the competitors. Companies that tend to contract out development and implementation obviously would have a different profile; hardware companies tended to show a higher percentage of resources dedicated to product evaluation (presumably software) and hardware engineering. The latter tend to support highly specialized contracts.

There was also a noticeable shift from 1989 to 1990 in two important categories. Implementation resources went down from 57% to 46%; project management resources went up from 10% to 15%. Apparently,

vendors accomplish their tasks more efficiently but need to manage the project more intensely—probably a measure of the complexity of the tasks.

### 3. Conclusions—Organization/Responsibilities

INPUT believes the tendency in organizations will continue to be toward the formation of separate organizations to provide centralized overall management and direction to the information services business. The SI activities will be conducted under the management direction of the information services organizations. Bull HN, DEC, and IBM are already moving in this direction. Furthermore, there will be an increasing tendency not only to centralize the planning, marketing, and contract administration activities, but also to house in these central organizations some specialized technical skills, proprietary software and methodology development, and specialized industry expertise. Almost no business leverage can be obtained in an increasingly competitive market unless this centralization takes place.

Furthermore, as various competitors better organize their strategies, policies, and procedures for management of the business, we can expect to see a continued decentralization of account management, sales, and project execution. INPUT's view of the future organizational structure of federal and commercial SI organizations is illustrated in Exhibit IV-6.

EXHIBIT IV-6

#### Future Organizational Structure of SI Vendors

- Separate SI organization—division/subsidiary
- Matrixed organization structure
- Increased centralization of:
  - Management, marketing, contract administration
  - Specialized technical/vertical market expertise
- Increased decentralization of:
  - Account management
  - Project implementation



**B****Financial  
Characteristics****1. Leading Competitors' Revenues**

Based on this research, as well as the work done for the 1990 Market Forecast Report, INPUT's estimates of revenues for the top 10 systems integrators are contained in Exhibit IV-7. The ranking is by total revenue.

EXHIBIT IV-7

**Systems Integration Revenues, 1990  
(Estimated)**

	(\$ Millions)		
	Comm.	Fed.	Total
IBM	480	800	1,280
Andersen Consulting <sup>(1)</sup>	618	68	686
EDS <sup>(2)</sup>	214	430	644
Science Applications (SAIC)	70	400	470
Computer Sciences (CSC)	91	350	441
Unisys	70	305	375
Digital Equipment (DEC)	310	50	360
McDonnell Douglas	111	208	319
PRC	69	170	239
Boeing Computer Services (BCS)	20	180	200
<b>Totals</b>	<b>2,053</b>	<b>2,961</b>	<b>5,014</b>

(1) Andersen's revenues include no hardware pass-through.

(2) EDS' revenue does not include GM-generated revenues.

In total, the revenues of these 10 companies are equivalent to 78% of the total 1990 systems integration end-user expenditures of \$6.4 billion. Exhibit IV-8 ranks the top competitors in the federal and commercial markets.

## EXHIBIT IV-8

### Top Four Vendors Commercial and Federal SI

1990 Market Share

Commercial		Federal	
Vendor	Percent Share	Vendor	Percent Share
Andersen Consulting	16	IBM	32
IBM	12	EDS	17
DEC	8	SAIC	16
EDS	5	CSC	14

## 2. Revenue Growth Rates

The respondents' forecasts of potential growth rates for their individual companies were lower than INPUT's 1990 forecast. This reflects the recognition by vendors that IS budgets are being tightened, and the factoring in of lengthening schedules for SI projects, causing their own revenue projections to be lowered. INPUT's 1990-1995 market analysis projects federal and commercial SI growth at 13% and 23%, respectively. Exhibit IV-9 summarizes the growth projections made by the vendors.

## EXHIBIT IV-9

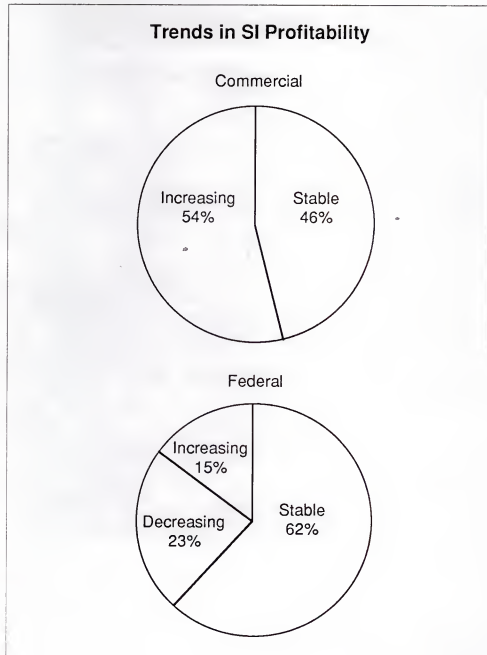
### Respondents' Forecast of SI Revenue Growth

Sector	Percent		
	Low	High	Average
Commercial	12	30	22
Federal	5	20	15

### 3. Profitability and Margins

Although the majority of the companies participating in the survey were not willing to disclose profit margins on their SI activities, most were willing to talk about general trends in profitability, both on the aggregate and component levels. INPUT believes that, for the companies surveyed, the profitability of commercial SI was between 5% and 20%, and was 5% to 10% in the federal arena. The respondents' views of trends in profitability are summarized in Exhibit IV-10.

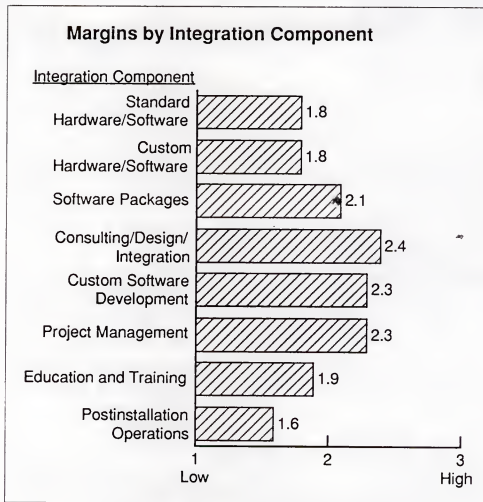
EXHIBIT IV-10



INPUT believes the views expressed regarding the margins in the federal SI marketplace reflect two conditions. Pressure on federal budgets is continuing to reduce the number of opportunities available; and this pressure is making the market more competitive and less profitable.

The information in Exhibit IV-11 expresses respondents' views on the profitability of various components of systems integration projects. The information was obtained by asking interviewees to rank (H = High, M = Medium, L = Low) the margins they obtained on each type of product or service listed. This data was then converted to a numerical scale, with one being low and three being high, and then averaged.

EXHIBIT IV-11



It should be noted that all respondents reported that their SI operations were profitable. From the data available on the margins in various components and general trends in profitability, INPUT concludes that the business can be profitable, although profitability seems greater in commercial than federal project opportunities.

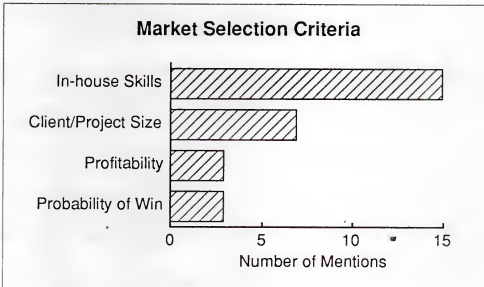
## C

Strategies and  
Markets

## 1. Market Selection

The most important market selection criterion for most vendors, as summarized in Exhibit IV-12, was the vendor's in-house skills and how they matched the requirements of the project. The next most important factor was the size of the project's potential. This was variously expressed as client size, project size, or market size; all are a measure of project potential. Also receiving multiple mentions were expected profitability of the project and the probability of win.

EXHIBIT IV-12



Although the reasons may vary, it is very clear from the survey results that the majority of vendors still have a strong vertical-industry focus. Almost 60% of the respondents operate exclusively on a vertical-industry basis. By comparison, 25% indicated they marketed only on a functional basis. Details are in Exhibit IV-13. Some observations are worth noting:

- In most instances, companies with a strong functional orientation were either new to the market or were focusing on the application of specific technologies, methodologies, or cross-industry applications.
- Most hardware vendors and large systems houses such as EDS clearly have strategies that are vertically oriented. Most intend to operate in almost all markets. Only those large firms have the resources necessary to participate in many markets.
- The more business consulting capability available to a given vendor, the stronger the vertical industry focus. These vendors have established skills in certain vertical industries and want to capitalize on them in the SI market (see Exhibit IV-14).

EXHIBIT IV-13

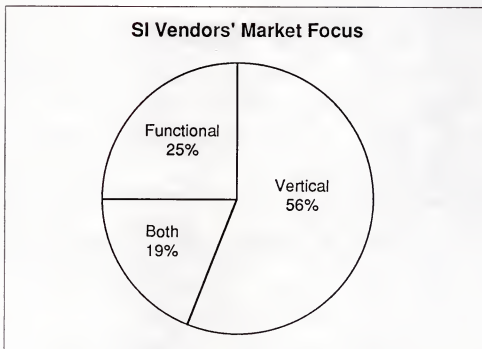


EXHIBIT IV-14

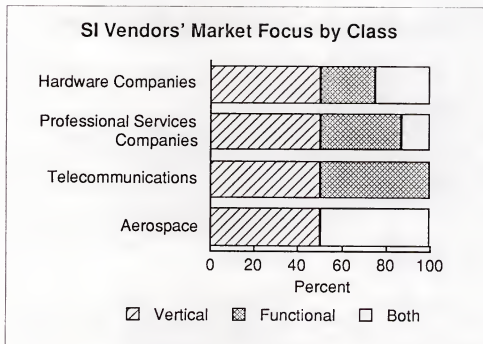
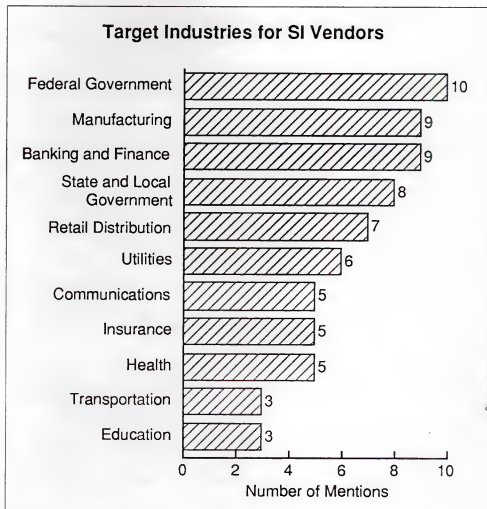


Exhibit IV-15 shows the targeted vertical industries by frequency of mention. Industries with the most mentions generally are also those generating the most revenue for vendors.

EXHIBIT IV-15



## 2. Market Characteristics

Based on the characteristics of these markets (analyzed in INPUT's 1990 SI market forecast report, *U.S. Systems Integration Markets, 1990-1995*), it is not at all surprising to find the heavy clustering in government, manufacturing, banking and finance, and retail distribution. In fact, the ranking correlates closely to current individual vertical market sizes. In addition to their size and growth rates, summarized in Exhibit IV-16, each of these markets has some unique characteristics that make them attractive.

- **Federal Government** - Although budget pressures and a high level of competition have reduced the growth rate substantially, the sheer size of the market opportunity still makes it number one on the list of targets. Many major federal systems still need upgrading and modernization, and there continues to be a lack of skilled internal personnel available to implement such changes.

## EXHIBIT IV-16

**Summary of Vertical Market Characteristics**

Vertical SI Market	\$ Millions		
	1990 Revenues	1995 Revenues	CAGR (Percent)
Federal Government	2,493	4,573	13
Discrete Manufacturing	980	2,934	25
State and Local Government	576	1,642	23
Utilities	469	924	14
Banking and Finance	369	1,280	28
Retail Distribution	241	830	28

- **Discrete Manufacturing** - With a substantial base of \$980 million in 1990 and a growth rate of 25%, discrete manufacturing offers one of the best opportunities for systems integrators. Globalization and the resulting competition, along with the rebuilding of the manufacturing infrastructure, call for heavy investments in systems over the next five years.
- **State and Local Government** - Although INPUT believes the marketing and sales expense of capturing state and local opportunities will be high, the market is still promising. Under the current federal strategy, state and local governments are assuming an increasing share of the administration of programs. This will call for systems investments in an environment where in-house capabilities are weak. In addition, the opportunity for integrators to replicate solutions from state to state could make up for lower margins and increased marketing and sales costs.
- **Utilities** - The sudden appearance of utilities in INPUT's list of significant vertical markets represents the identification of a large volume of CSI work in electric utility plant and grid management that was not recognized in earlier forecasts. Pressure to apply technology, minimize materials consumption, and optimize the application of resources should support a 14% CAGR from 1990 to 1995 in this industry. However, conservative management will still limit the growth of opportunities in this market.



- Banking and Finance - While in-house capabilities and "proprietary" solutions work against the use of outsiders in the largest institutions, a large number of opportunities still exist.

Back-office operations at brokerage houses have been consolidated by mergers in the industry, resulting in fewer systems integration opportunities.

The increased dependence on networked applications such as national ATM networks has created more communications systems integration opportunities, though these require special expertise on the part of the SI vendor.

- Retail Distribution - Though not as large as the other markets, this sector, like manufacturing, is undergoing significant change and restructuring because of competitive market pressures, creating opportunities for systems integrators.

For vendors concentrating on specific technology opportunities or cross-industry markets, the primary targets are presented in Exhibit IV-17.

EXHIBIT IV-17

### Target Functional SI Markets

- Telecommunications networking
- Image processing systems/applications
- Office automation implementation
- Logistics systems

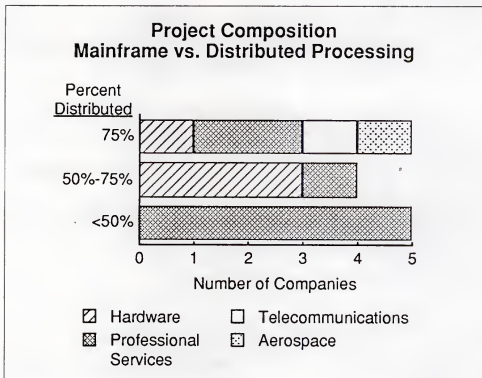
In almost every instance, these markets have been selected based on the availability of internal capabilities or products. Although there are clearly SI opportunities in these specialized areas, INPUT believes that, over time, the vendors focusing solely in areas involving infrastructure, etc., will evolve in one of two directions:

- They will develop specialized industry expertise applicable to their product speciality in order to maintain position as a prime integrator.
- They will seek teaming and partnership arrangements with other integrators that bring them opportunities to leverage their particular capabilities.

Without pursuing one or both of these directions, these vendors are likely to find very limited market opportunities.

Another emerging market characteristic is the distinction between mainframe-based and distributed applications. Overall, respondents to INPUT's survey said that 58% of their projects involved distributed systems while 42% were mainframe-based. The results are even more revealing, however, when the type of vendor is associated with the response. Exhibit VI-18 illustrates that those reporting low levels of distributed processing projects were professional services firms. All three of the Big 6 firms polled reported this low level of distributed application.

EXHIBIT VI-18



It was not too surprising that most of the equipment vendors fell into the 50%-70% range, since their product lines covered the entire range from mainframes to micros. Those reporting more than 75% distributed processing projects included NCR, well known for its point-of-sale equipment, and AT&T—both of whom are strong UNIX and open systems advocates. Two respondents did not know what the mix of projects was.

### 3. Market Promotion

As part of the survey, INPUT examined how respondents approached their potential markets. Detailed information regarding the positioning of specific vendors is contained in Chapter II and in Section B of this chapter. However, another useful area from which to draw some comparisons between the vendors is promotion techniques.

As part of the questionnaire, vendors were asked to describe the various ways they promote their products, and to give a subjective indication of the effectiveness of these techniques. Exhibit IV-19 ranks the various approaches by the number of times they were cited. The effectiveness rating (High, Medium, Low) represents a clear majority view in that the responses were extremely consistent within the survey group.

EXHIBIT IV-19

**Evaluation of SI Promotion Techniques**

Promotion Technique	No. of Mentions	Effectiveness
Word of mouth/Reference	17	High
Trade publications	12	Medium
Public seminars	14	Medium
General business publications	7	Medium
Direct marketing	8	High
Direct mail	8	Low
Television	2	Low

In addition, a number of other items were mentioned. Two that received high ratings were the use of internal consultants and promotion through field technology centers.

The conclusions are quite clear. The best way to get business is word-of-mouth reference selling, coupled with a strong direct marketing campaign. This is probably due to the fact that the "offering" is conceptual and difficult to describe. Does this mean there is little hope for more traditional promotional techniques in the long run? INPUT doubts it. As the concept of systems integration becomes more clearly defined in the marketplace, use of traditional promotion methods will increase.

**4. Competition**

As anticipated, most survey participants were reluctant to directly discuss their competition. However, almost all were willing to name their primary competitors in the commercial and federal marketplaces. Exhibit

IV-20 lists the most frequently mentioned competitors by number of mentions in rank order for the federal and commercial markets.

EXHIBIT IV-20

SI Competition as Perceived by Vendors (Number of Mentions)	
Commercial	Federal
EDS	CSC
Andersen (tied)	EDS
IBM	Andersen
CSC	IBM Unisys (tied)

It is revealing that the same vendors are identified as the top four in both markets, at least in the eyes of their competitors. A review of Exhibit IV-7 shows the same four are also the leading revenue producers, though their actual ranking in the market is not the same as perceived by their competitors. For example, though IBM was tied for fourth place in the federal market in the "mention" (Exhibit IV-20) data, it really generated more revenue from the federal market than its competition. Conversely, Andersen Consulting was number one (tied with EDS) in the commercial market and IBM was second, both in frequency of mention and actual revenue generated. The market participants do, indeed, understand who their competitors are.

## D

### Capabilities and Products

Information regarding vendor capabilities, alliances, and products was gathered in three different parts of the survey.

- One question focused on the general business capabilities in a broad sense, dealing with such issues as risk management, industry, technology and project management expertise, and client relationships.
- Two questions dealt with more specific skills required to win and implement SI projects, and explored where and how alliances were used by the individual vendors.
- Two other questions explored what proprietary technologies, if any, particular vendors felt they brought to the market.





















Examination of the responses in these areas confirms some suspicions and, perhaps, sheds some new light on how vendors are coping with the problem of credibly selling and delivering "full solutions."

### 1. Overall Capabilities and Skills

The survey requested that each vendor provide a self-evaluation of its own capability in five areas: ability to manage risk, project management skills, technology expertise, vertical industry capabilities, and client relationships as they applied to its systems integration business. Each vendor was asked to rank its competence in each area on a scale of 1 to 5 (1 = Low, 5 = High) at the company's time of entry into the SI business and at present. Exhibit IV-21 shows how the four classes of vendors compared on an average in their current capabilities. Some points worth noting are:

EXHIBIT IV-21

#### Overall SI Capabilities by Class

Capability or Skill	Hardware Manufacturers	Professional Services Companies	Telecommunications Companies	Aerospace Companies
Ability to manage risk				
Project management skills				
Technology expertise				
Vertical industry expertise				
Client relationships				



High



Medium



Low

- In general, the professional services companies are extremely confident about their ability to deal with the execution of SI engagements. More importantly, they feel quite comfortable with client relationships in their targeted vertical industries. This confidence probably results from the fact that professional services companies frequently are involved in pre-engagement consulting during the problem identification phase of SI efforts. The other classes of vendors most likely find themselves responding to bids, not helping to create them. This "up-front" consulting capability is a strong leverage point for professional services firms.
- It would seem logical that aerospace companies would have the same high degree of comfort with their federal clients as the professional services firms do with commercial clients. After all, most of them have been working the federal market with a great deal of success for a number of years. INPUT's survey results support this hypothesis, but it is interesting to note that this is a big change from the last survey. In INPUT's 1989 report on SI, the aerospace respondents had "medium" responses. That result was attributable to the fact that they were new arrivals in the commercial market and were not certain that they could develop the vertical industry skills required to participate. Many in the industry still feel they have not made the cultural transition, even though they feel much more confident.
- Although the sample was limited, the telecommunications firms appear to have increased confidence in their abilities since the 1988 survey, although they still rate themselves lower than the other market participants. They rated themselves high on the ability to manage risk due to their typically large asset base and relative financial stability.
- Almost everyone had rated themselves highly in technology skills during INPUT's previous survey. This time, three of the four categories rated themselves as only medium. INPUT believes this is caused by a rapid increase in the complexity of technology, i.e., open systems porting, graphic user interfaces, etc., with which the vendors are not as familiar. The hardware companies continue to focus on their understanding of architecture and operating systems, while the professional services companies are more oriented toward applications and data-related technologies.

Since this is the second vendor survey INPUT has conducted, shifts in market emphasis can be identified by comparing results from the two surveys. Earlier, the shift in organizational structure was noted. The comparison of the value of implementation skills presents another interesting shift. Though most of the value responses showed a continuing high regard for project management skills and design and integration skills, there was also an upward shift in the importance of education/training and documentation skills. Exhibit IV-22 illustrates the shift in responses.

## EXHIBIT IV-22

**Comparison of Capabilities Importance**

Capability	1989 to 1990 Shift
Education/training/documentation	+
Standard computer hardware	-
Custom computer hardware	-
Communications hardware	-
Network management	-

- + Increase in importance
- Decrease in importance

Perhaps the most interesting shift is in the reduced importance of hardware capabilities. As expected, the equipment vendors still rated it of high value, but other SI vendors felt it was only of low or moderate value. INPUT believes this is a direct consequence of aggressive alliance programs on the part of the equipment vendors. Hardware capabilities are still important, but non-equipment vendors have all established alliances with equipment vendors that make them more capable of operating in the SI market without their own hardware capability.

The parallel finding that the value of network management capability has also shifted has a related, but somewhat different, explanation. The SI vendors don't feel they have to have that capability in-house, because the VAN vendors and the major carriers are willing to work with them. The SI vendors appear to have recognized how difficult it is to acquire network management expertise on their own.

Responses obtained from the same survey question regarding alliances are as indicative of the respondents' capability in SI project implementation as their self-evaluations of these capabilities. The implications are discussed in more detail in the next section.

## 2. SI Alliances

Virtually every vendor surveyed makes heavy use of alliances in the execution of its systems integration business. The business management of these relationships varied between vendors; about 60% of the vendors surveyed have some sort of formal program for alliance management and



the remainder proceed on an *ad hoc* basis, as illustrated by Exhibit IV-23. When compared to last year's response, the aerospace companies continued to report no formal alliances, while communications companies now report that they have established formal alliances.

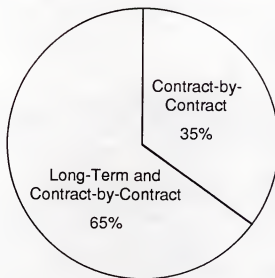
EXHIBIT IV-23

**Formal Alliance Programs**

Company Type	Yes (Percent)	No (Percent)
Hardware Manufacturers	75	25
Professional Services Companies	55	45
Communications Companies	100	0
Aerospace Companies	0	100
Vendors Overall	58	42

The actual formation of alliances is overwhelmingly on a contract-by-contract basis, whether or not they come under the auspices of a formal program. Exhibit IV-24 indicates that one-third of the vendors utilize a contract-by-contract arrangement solely, while the other two-thirds utilize both long-term and contract-by-contract approaches.

EXHIBIT IV-24

**Alliance Structures**



Examining how the various classes of vendors utilize their alliances provides some interesting insights into vendor capabilities and strategies. Exhibit IV-25 presents, by vendor class, an evaluation of the degree to which each class utilizes alliances to supplement the in-house skills required for systems integration.

EXHIBIT IV-25

## Propensity to Use Alliances by Class

Capability or Skill	Hardware Companies	Professional Services Companies	Telecommunications Companies	Aerospace Companies
Business consulting skills				
Design methodology				
Design/integration capabilities				
Project management skills				
Software development				
Education, training and documentation				
Packaged applications software				
Packaged systems software				
Standard computer hardware				
Customized computer hardware				
Communications hardware				
Network management capabilities				
Service and repair capabilities				
Software maintenance services				

High   Medium   Low

A number of patterns emerge from this analysis.

- It is quite clear that the equipment manufacturers need and are willing to make alliances at the business consulting level. Business consulting is a skill they typically lack. On the other hand, it is not completely clear why such heavy use of alliances is indicated for items such as software development and standard computer hardware. INPUT believes a number of factors are at work here.
  - Since the client base (therefore, potential list of SI prospects) is so large, equipment manufacturers probably can't meet the demanding requirement for SI development resources. They are, consequently, forced to contract out for implementation or industry expertise.
  - Since equipment vendors are frequently involved in projects with high levels of advanced technology, it is often necessary to go outside to acquire new technology products as part of the total solution.
  - Equipment manufacturers typically have high overhead applied to their labor resources. It is often much easier to be competitive if they subcontract the labor portion of SI projects to professional services firms with more favorable overhead rates.
- The professional services firms exhibit a pattern that indicates a high degree of self-sufficiency at the high end of the life cycle. They seldom use outside firms for items such as design methodology, project management, or systems development. Because, as a class, they don't have hardware or support capabilities, they depend on alliances for these components. INPUT anticipates that more of these firms will develop some capabilities in these areas. In fact, there has been a shift away from "high" to "medium" responses in the 1990 survey, indicating that these vendors are already becoming more self-sufficient in many SI capabilities.
  - Firms like Andersen Consulting are developing their own industry-focused applications packages and have entered the systems operations business, but have little use for being directly involved in the hardware business.
  - Firms like EDS see systems operations as a major objective, and will focus on winning the business on the front end in order to capture the contract at the end of the implementation. On what hardware and with what packages are irrelevant to some extent.
- Aerospace companies and telecommunications companies exhibit many of the same alliance characteristics as professional services companies. They are stronger on the front end, except for business consulting, and use a variety of alliances for dealing with hardware and

software. On the other hand, they seem to be much more self-sufficient on the support and maintenance aspects of contracts when required, and also feel confident about their own network management skills.

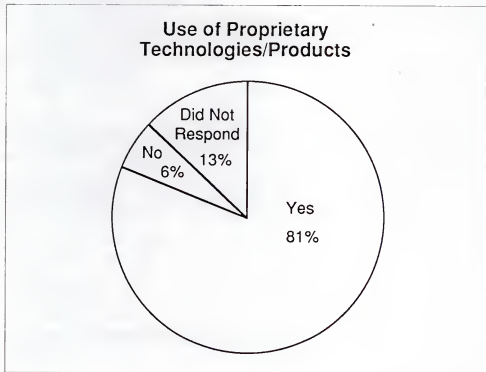
Finally, understanding a particular SI vendor's alliances provides a good indication of a vendor's internal capabilities and insight into longer range strategy. As competitors settle into specific market niches, INPUT anticipates continued acquisitions and mergers to reduce dependence on alliances for capabilities that are critical to a particular vendor's SI market strategy.

### 3. Proprietary Products/Technologies

In addition to its internal capabilities and the strengths of its allies, the remaining "arrows in the quiver" that an SI vendor brings to bear on the competition are proprietary technologies and products.

As indicated in Exhibit IV-26, over 80% of the respondents to the survey indicated they had proprietary products that gave them a unique or competitive advantage in the marketplace.

EXHIBIT IV-26



Although most vendors would not comment on the specific capabilities of these products, they did indicate what types of products they were. Exhibit IV-27 presents the tabulation of products, showing the incidence of mention for each category.

## EXHIBIT IV-27

**Incidence of Proprietary Products by Category**

Proprietary Product Type	Mentions
Project management tools	11
CASE tools	11
Industry-specific software	10
Network management technology	9
Connectivity products	8
Hardware/systems software	7
Data management technology	3
Other (AI, object-oriented programming, imaging systems)	6

Some specific product capabilities mentioned included:

- Image processing hardware, data base management systems, and related applications products for records management
- Applications shells specific to particular industries or cross-industry functions that can be rapidly tailored to meet SI client requirements
- Several network management products that presumably offer the ability to manage heterogeneous networks
- Expert systems to support manufacturing and banking and finance implementations

There is no clear evidence that any vendor's existing proprietary product or process has any significant impact on success in systems integration. However, the vendor with a unique capability—whether methodology, vertical industry expertise, or products—will have an edge on a particular project.

INPUT believes that unique products, particularly with a vertical industry focus, will give specific vendors a real competitive advantage. In addition, unique products that facilitate the systems design, implementa-

tion, and control of an SI engagement will offer vendors an opportunity to achieve greater profit margins through increased productivity of the professional services component of specific projects, or allow them to offer more competitive prices to the prospect.

## E

### Overall Comparison of Competitors

This chapter has attempted to compare and analyze the organizational structures, financial characteristics, capabilities, alliances, and products of the respondents to the survey. In some cases, meaningful comparisons could be made by using the vendor classification scheme developed in Chapter III - Competitive Structure. In others, the classification scheme was less productive. In an attempt to combine these comparisons in some meaningful way, INPUT has selected several parameters which appear to be key differentiating points, and offers the following observations:

- **Market Share/Position** - With the exception of Andersen Consulting, the large equipment companies and major federal integrators dominate the current market in terms of total systems integration revenues. This market inertia positions them well to continue to lead the pack. However, stable or potentially declining margins for federal integrators, and the difficulty many have had moving into commercial markets, could make maintaining that lead difficult. Finally, everyone at the top of the list can expect increased competition from the growing professional services organizations, the component of the business where the potential for high margins is greatest.
- **Vertical Industry Expertise** - The good news is that vertical market expertise and focus clearly provide a business advantage for systems integrators. The bad news is that almost everyone is focusing on the same vertical markets. Even though these markets are large, everyone can expect increasing competition in the "hot" verticals.
- **Ability to Manage Risk** - Financial power and internal skills play a role in this differentiating factor. Clearly, the equipment companies take the lead in the financial area, closely followed by companies like EDS. The federal integrators' deep pockets have disappeared because of the shrinking federal budget and trouble in other sectors. In terms of financial capacity, the communications companies should be in a strong position. However, lack of experience in the computer business, coupled with relatively weak project management skills, increases their level of potential exposure.
- **Internal Capabilities, Alliances, Products** - It is quite difficult to make a clear-cut judgment as to how the four major classes of vendors compare on this point. The questionnaire proposed 13 skill/capability areas which might be key to effectively supporting a vendor's systems integration business, and explored vendors' capabilities in these areas from in-house and alliance perspectives. Clearly, not every vendor's strategy

required all 13 capabilities, in general or on specific projects. The proper use of alliances will, however, level the playing field between vendors as they supplement their internal capabilities with strategic alliances. Their responses to the importance of various skill categories, discussed in Section D, suggest that they feel that alliances are working well for them.

To help simplify the comparison, INPUT has developed the structure described in Exhibit IV-28. Essentially, the structure divides the 13 skill/capability areas into three categories.

- Those that are primarily utilized to win and control the business
- Products and capabilities necessary to successfully implement
- Support and service capabilities that focus on systems operations and post-implementation support

EXHIBIT IV-28

Classification of SI Skills	
Skill Class	SI Capability/Skill
1. Win/control the business	Consulting skills Design methodology Design/integration capability Project management skills
2. Successfully implement	Software development Education/training/documentation Packaged systems software Standard computer hardware Customized computer hardware Communications hardware
3. Support and service	Network management capability Service and repair capability Software maintenance services

Utilizing this classification scheme for SI skills and capabilities and the other major differentiating factors discussed above, INPUT has prepared categories for an overall comparison, shown in Exhibit IV-29. The vendors are compared by class.

## EXHIBIT IV-29

## Overall Vendor Comparison by Class

Capability or Skill	Hardware Companies	Professional Services Companies	Telecommunications Companies	Aerospace Companies
Market Share				
Commercial				
Federal				
Vertical industry expertise				
Ability to manage risk				
Internal capabilities, products, alliances				
• Win/control the business				
• Successfully implement				
• Support/service				
Client relationships				

Strong    Average    Weak

Clearly, the judgments made in the preparation of Exhibit IV-29 are subjective. However, INPUT believes the evaluation to be fair, based on the responses to the survey and its knowledge of other competitors who did not participate in the survey.

As a final note, any comparison between vendor classes or individual vendors must be taken in the context of their unique strategies and objectives, and stage of development in the business. For example, an apparent weakness in service and support is not particularly relevant if the vendor doesn't perceive itself to be engaged in that aspect of the market. Likewise, competitors just entering the market are likely to receive lower evaluations than established competitors.





## COMPANY PROFILE

## Contents

Company Name	Date
AT & T	1/91
American Management Systems (AMS)	1/90
Andersen Consulting	8/90
Bechtel Corporation	4/89
Boeing Computer Services	1/90
Bull HN Information Systems	2/91
Computer Sciences Corporation	8/90
Computer Task Group (CTG)	4/89
Coopers & Lybrand	2/91
Digital Equipment Corporation (DEC)	2/91
Electronic Data Systems (EDS)	8/90
Grumman Data Systems	1/90
International Business Machines (IBM)	2/91
KPMG Peat Marwick	1/91
Litton Computer Services	4/89
McDonnell Douglas	1/90
NCR	1/91
NYNEX	8/90
PRC, Inc.	1/91
Price Waterhouse	2/91
Science Applications International Corporation (SAIC)	1/90
SHL Systemhouse	8/90
STM Systems Corporation	1/91
Unisys Corporation	4/89



*Library*

## COMPANY PROFILE

AT&amp;T

### 1. Key SI Contacts

Mr. Curtis Crawford  
Vice President—Sales, Service and Support  
AT&T  
1776 On the Green, Room 9B17  
Morristown, NJ 07962

Mr. Ed Kozemchak  
Director - Customer Application Engineering and Training  
AT&T  
580 Howard Avenue, Room 4A423  
Somerset, NJ 08873

### 2. Description of Principal Business

AT&T is the leading domestic provider of telecommunications services and equipment. In 1989, AT&T's total revenues reached \$36.1 billion. AT&T operates the largest switched long-distance voice network and manufactures and distributes telephone switching equipment. In addition, AT&T sells and leases voice and data business equipment. AT&T provides a wide variety of international network services.

AT&T provides a wide variety of international network services, including network services to foreign governments and national organizations. In its traditional lines of business, AT&T has superior technical capability and provides services to virtually all vertical markets. The corporation has long been known as a leader in basic research.

### 3. Competitive Position

As a communications company, AT&T is still the largest seller of switched telecommunications services, with more than half of the domestic market. AT&T is still the strongest provider of national communications services, but faces growing competition from two sources: independent services providers such as Sprint and MCI, and companies such as Sears and some of the larger hotel/motel chains, which are implementing national networks primarily for their own use but are including spare capacity for growth and for resale. AT&T remains the major supplier of central office switching equipment, but is experiencing increasing competition from companies such as General Telephone, Northern Telecom, and Fujitsu. Since divestiture, AT&T has lost market shares of the end-user equipment market to the Bell Operating Companies and the third-party (largely foreign) market. It has become much more aggressive in marketing and pricing its products over the last year.

Any competitive weaknesses that AT&T may have can be directly related to two significant factors:

- First, the traditional services that AT&T provides are subject to regulatory approval by the Federal Communications Commission (FCC). This gives competitors advance knowledge of service offerings and pricing, as well as the right to object to any provisions that they believe to be anticompetitive.
- Also, AT&T has to do battle with its own internal bureaucracy—a legacy of its monopolistic days. It takes great effort on AT&T's part to be responsive to changing opportunities and markets. This reduces AT&T's ability to consistently focus its efforts to achieve its strategic goals.

AT&T has been providing integrated systems to the federal SI market for over 20 years, and network integration to the commercial market for more than ten years. AT&T entered into the computer systems integration market approximately four years ago, with separate communications and computer systems integration organizations. Since INPUT's last report in 1988, however, AT&T has distributed its computer systems integration efforts closer to its customers — through regionally deployed Customer Application Engineering Centers. These Centers are coordinated through a National Customer Application Engineering Center in Somerset, New Jersey.

#### 4. Markets Served

In its traditional business, AT&T is a major player in virtually every vertical industry sector. The systems integration activities to date have focused heavily on AT&T's strong functional capability in communications networks.

- AT&T Computer Systems has targeted the following functions and industries:
  - Network computing—making use of AT&T's major expertise in systems connectivity technologies
  - Business orchestration—i.e., workflow automation tools
  - Federal, state, and local governments
  - Telecommunications
  - Lodging, transportation and retail

All these targets show that AT&T is shifting its focus on communications as a necessary adjunct to the life of a viable business organization.

## 5. Recent Events

The most important single recent contract won by AT&T is the award of the federal FTS-2000 contract. FTS-2000, a private nationwide federal administrative switched voice communications network will make AT&T a vital supplier of communications facilities and services to the federal government well into the 21st century.

Recent events that happened while this profile of AT&T was being written suggest that AT&T is beginning to more aggressively pursue a more prominent role in the information systems and technology industry: in December, 1990 AT&T made a \$6 billion offer for NCR, the nation's fifth-largest computer manufacturer.

## 6. SI Organization

AT&T's SI organization has shifted from highly centralized with matrixed support to largely decentralized. It is interesting to note that in its operation in the commercial SI market, AT&T operates most functions in both centralized and decentralized styles, with few functions either wholly decentralized or centralized. It has implemented a major change in its SI service by decentralizing its project management and much of its implementation capability. Like IBM, it recognizes the need to get the implementors close to or on the client's site. In the federal SI market, however, AT&T responds to the federal penchant for dealing with a single manager on all issues of consequence. In the federal sector, AT&T can operate in essentially fully centralized style, as shown in Exhibit ATT-1.

EXHIBIT ATT-1

### AT&T Business Functions Centralized or Decentralized

Responsibilities	Commercial	Federal
Strategy, long-range planning	C	C
Marketing & promotion	B	C
Account management, sales	D	C
Contract review & approval	B	C
Project management & control	D	C
Implementation & development	B	C
Hardware/software acquisition	B	C

C = Centralized, D = Decentralized, B = Both

AT&T currently reports approximately 400 full-time employees dedicated to SI. This is not surprising; AT&T is a relatively new entrant into the separate SI market. Exhibit ATT-2 shows the distribution of AT&T staff across the various SI activities.

EXHIBIT ATT-2

Distribution of SI Personnel—AT&T	
Capability	Percent
Management, strategy & planning	10
Legal support/contract administration	5
Project management	10
Systems development/implementation	40
Hardware/software evaluation/acquisition	15
Hardware engineering	10
Sales	10

## 7. SI Business Objectives

INPUT still believes that AT&T's major SI objectives will be to identify and pursue niche opportunities that make the best use of AT&T's strengths. Particularly, INPUT believes that AT&T will:

- Focus on opportunities that make the best use of its strengths in long-distance network design, implementation, and management
- Place emphasis on alliances related to specific opportunities. As the major provider of long-distance telecommunications services, AT&T is a logical choice as an ally for other vendors to provide the telecommunications component of key contracts.
- Use SI as a means of pulling together and marketing its own services. AT&T will develop strategies that focus on providing services, such as customized telemarketing solutions, that require the combination of computers, custom software, and network services that AT&T already provides.

If, however, AT&T's offer to acquire NCR succeeds, all this will change. AT&T will instantly become a much more major participant in the SI market (as in other parts of the information systems and technology market).

Up to now, AT&T has apparently seen SI as a business opportunity that should improve the profitability of its other lines of business and as a

means of promoting the sale of its principal products and services. Also, like other hardware and services providers, AT&T has been under increasing pressure from its customer base to respond to requirements for integration services. Finally, INPUT sees the provision of SI services by AT&T as an opportunity for AT&T to differentiate itself from its competitors in its increasingly competitive traditional markets. Combined with NCR, however, AT&T will be in a position to directly influence the computer and telecommunications markets for years to come.

## 8. SI Capabilities Evaluation

AT&T has exceptionally strong capabilities in areas related to the design, development, and management of large telecommunications networks. In particular, the alliances identified above give AT&T a good mix of hardware and software capabilities that support its pursuit of SI business.

AT&T is working aggressively to establish its strengths in other key areas, such as:

- **Business Consulting** - AT&T has a strong capability in this area when it comes to network development and management. This capability is definitely marketable in niche areas. It has traditionally used alliances to supplement this skill with general business consulting, but will need to significantly strengthen its own capabilities to compete in the general SI market.
- **Design/Integration, Project Management** - Again, AT&T has significant capability at the network level, but little in the area of applications systems design or data integration. AT&T has been working to establish alliances that would contribute to the development of this area. Its earlier alliance with EDS, and later with CSC, are examples in this area.
- **Software Development** - With the exception of its network exchange software, AT&T has little experience in the development of software applications. This is a significant weakness.
- **Education, Training, and Documentation** - AT&T has strong skills in training and education in telecommunications. AT&T operates a school for all levels of training for telecommunications professionals that is open to the public. In recent years, education and training focusing on UNIX and network computing have broadened the telecommunications offerings.
- **Packaged Application Software** - Since deregulation, AT&T has been working to develop its customer billing and call accounting systems as packaged products to sell to RBOCs and other carriers; however, this development has not seen great success.

- **Packaged Systems Software** - Other than UNIX, AT&T has no significant experience in system software development and marketing. AT&T must rely on alliances for this experience and capability.
- **Standard Computer Hardware** - For many years, AT&T has developed its own line of computers to be used as the backbone of its many levels of automated switches. Outside of AT&T, however, acceptance has been limited. INPUT believes that AT&T will continue to have difficulty marketing its own line of general purpose hardware products and will continue to rely on alliances with other manufacturers to provide significant hardware components in its SI bids.
- **Communications Hardware** - AT&T's communications hardware reputation is extremely strong. INPUT believes that AT&T's only weakness in this area is the fact that AT&T has not been as successful as other vendors in packaging its own hardware with software and services to offer a comprehensive set of solution products.
- **Network Management and Operations** - As operator of the nation's largest telecommunications network, AT&T has an established reputation. INPUT believes that this is one of AT&T's greatest strengths. It remains to be seen whether AT&T can extend its credibility to networks of large (in numbers or size) computer systems.
- **Service and Repair/Software Maintenance** - AT&T has extensive experience in the servicing and repair of AT&T telecommunications equipment; these services are offered throughout the country, but traditionally only on its own equipment. Thus, AT&T has not yet shown itself to be a servicer of other manufacturers' equipment. As for software, AT&T has shown limited capabilities, consistent with the preceding comments on its offerings in that area.

## 9. SI Strategic Alliances

AT&T Computer Systems is developing both long-term and *ad hoc* contracts (i.e., alliances) with other vendors to complement its capabilities. AT&T relies primarily on contract-by-contract agreements for professional services; its long-term agreements provide sources for various types of computer hardware and systems software. Exhibit ATT-3 lists some of AT&T's long-term alliances and the purposes they serve.



## EXHIBIT ATT-3

**AT&T's Strategic Alliances**

Alliance With	Purpose
Informix	System software
Intel	Computer hardware
Istel	Systems integration
Oracle	System software
Pyramid	Computer hardware
Sybase	System software
Tandem	Computer hardware
Microsoft	System software

**10. SI Capabilities Summary**

AT&T is one of the world's most capable providers of telecommunications facilities and services. In addition, due to its role in the telecommunications market, it has developed great expertise in the management of almost incredibly large projects—few companies would have either the economic strength or the management vision to undertake laying an underwater intercontinental telephone cable.

Until its primary market (long-distance telephone service) was deregulated and the local telephone switching centers were split off, AT&T did not have to compete, since it was guaranteed a fair rate of return under the regulatory rules then in effect. Even now, AT&T appears to have to fight a management inertia that prevents it from moving into new markets aggressively. Its very size, however, gives AT&T a level of economic strength that is most advantageous. Over the last year it has also become much more competitive in its base telephone business.

AT&T is beginning to broaden its range of capabilities through the formation of strategic alliances with companies whose products and

services are well known and highly acclaimed. Thus, AT&T can now offer a nearly complete range of services to its SI market, ranging from advanced computer hardware through applications software based on advanced data management technologies. It remains to be seen how well AT&T can perform in the area of service and repair, where it must deal with non-AT&T equipment.

Exhibit ATT-4 summarizes INPUT's assessment of AT&T's SI capabilities.

EXHIBIT ATT-4

INPUT's Evaluation of AT&T's SI Capabilities	
Strengths	Weaknesses
Strong telecommunications Extensive resources Excellent technical skills Large customer base Geographic presence Potential for alliances	Narrow experience base Regulatory control Strong competition Price restrictions Strategic focus

## II. SI Marketing Strategy

AT&T Computer Systems' marketing strategy focuses on the growing market in network computing. This is an area where AT&T has great expertise and credibility.

In addition, AT&T has identified the following selection criteria for projects that it will show an interest in:

- Networking/communications requirements
- Fortune 2000 companies

These interests are clearly related to the area of AT&T's greatest strength: the development, implementation, and management of large-scale networks.

In both commercial and federal SI markets, AT&T sees its competitors as: IBM, DEC, Hewlett-Packard, NCR and Sun.

In its promotion, AT&T is beginning to use nearly all forms of advertising (other than direct mail); the most effective for AT&T are direct sales, trade/industry publications advertising, and word-of-mouth/client referrals.

## COMPANY PROFILE

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American  
Management Systems  
(AMS)

### 1. Key SI Contacts

Charles O. Rossotti  
Chairman  
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Arlington, VA 22209  
(703) 841-6000

#### Commercial

Patrick Gross  
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Arlington, VA 22209  
(703) 841-6000

#### Federal

Paul Brands  
Executive Vice President  
1777 North Kent Street  
Arlington, VA 22209  
(703) 841-6000

### 2. Description of Principal Business

American Management Systems (AMS) is a \$200 million systems integrator which offers a full set of products and services to its targeted market. See Exhibit AMS-1.

## EXHIBIT AMS-1

**AMS Offerings by Market**

Offerings	Financial Services	Federal/Aerospace	State/Local Universities	Telecommunication	Energy	Other Industries
Software Products	X	X	X	X	X	
Professional Services	X	X	X	X	X	X
Processing Services/System Operations	X	X	X			X

AMS has been a pioneer in several ways:

- AMS successfully offers a combination of packaged software and services aimed at specific markets; many other companies have tried and failed in offering such a combination.
- AMS has used this approach successfully for over ten years in both the government and nongovernment markets. Many of AMS' federal market competitors have not been successful in the commercial market.

AMS has over 2,700 employees and has offices in more than 20 cities in the U.S. and Canada.

### 3. Competitive Position

AMS' principal achievement has been its ability to build businesses with good growth rates across five market areas, as shown in Exhibit AMS-2. This positioning across widely different sectors will prove especially important over the next few years as expected cuts in defense spending take place. AMS should be able to redeploy its assets more readily than many of its military systems integration (SI) competitors.

## EXHIBIT AMS-2

**AMS Markets: Size and Growth**

Market	1988 Revenues		Revenue Growth 1987-1988 (Percent)
	\$ Million	Percent	
Federal/Aerospace	62.0	35.4	20
Financial Services	37.2	21.3	17
State/Local Governments and Universities	32.1	18.3	17
Telecommunications	11.2	6.4	64
Energy Industry	9.1	5.2	55
Other Industries	23.4	13.4	9
Total Revenues	175.0	100.0	21
Reimbursed Expenses	38.3		
Grand Total	213.3		

AMS' estimated systems integration revenues are shown in Exhibit AMS-3.

## EXHIBIT AMS-3

**AMS 1989 Systems Integration Revenues**

Business Component	\$ Millions
Federal	15
Commercial	125

A related strength is AMS' special relationship with IBM. This will be described and analyzed in Section 5, below.

AMS has "proceduralized" much of its knowledge of specific markets into software packages. This often enables AMS to offer a combination of packaged and customized services to clients. This approach, when it works as intended, can offer the customer a high-quality system that meets specific customer requirements, at a lower cost and a faster implementation time than competitors that offer only packaged software or only customized solutions.

AMS is bound to have some problems with its federal defense business over the next few years, as programs are stretched out and cut back. Even though AMS' federal business only accounts for about one-third and its defense business for about 15% of AMS' overall revenues, the uncertainties associated with these businesses could still create management and financial problems for AMS.

A larger issue is whether AMS has the project and financial skills to achieve a significant level of profitability in its SI business. In principle, AMS should be quite profitable:

- Two-thirds of its business is already in the commercial market; most of that is in specialized vertical markets.
- One-third of its business is in software products, which usually have higher margins.
- Its professional services are largely aimed at more specialized and value-added areas, rather than at the lower margin "commodity" business.

However, AMS' operating margins (6-8% range) and net margins (3-4% range) look much more like that of a relatively undifferentiated professional services firm (or provider of federal government services). See Exhibit AMS-4. This raises questions as to whether changes in its management approach may not be necessary in order to bring AMS' financial returns in line with its successful growth and record of technical achievement.

## EXHIBIT AMS-4

**AMS Margins**

Margins	1988	1987	1986	1985
Operating (Percent)	5.2	7.7	7.6	5.8
Net	3.5	4.3	3.9	2.9

**4. Markets Served**

AMS targets five principal markets:

- Federal
- Financial Services
- State and Local Government
- Telecommunications
- Energy

The subsectors that AMS targets are shown in Exhibit AMS-5. AMS' business is almost wholly focused in the U.S., with less than 5% from Canada and negligible amounts from other foreign sources.

## EXHIBIT AMS-5

**AMS Submarkets****Financial Services**

- Commercial banks
- Thrift institutions
- Finance companies
- Investment banks and securities firms
- Insurance companies
- Diversified financial companies

**Defense**

- Military services
- Defense agencies
- Aerospace prime contractors

**Civilian Federal Agencies****State, Local, and Other Governments**

- States and state agencies and Canadian provincial governments
- Cities
- Counties
- School districts
- Canadian government ministries

**Colleges and Universities**

- Universities
- Four-year colleges
- Medical centers
- Community colleges

**Telecommunications**

- Local telephone companies
- Long distance and international carriers
- Information services providers

**Energy Companies****Major Companies in Other Industries**

- Retail
- Distribution
- Consumer products



## 5. Recent Events

The most important recent event—in fact, one of the most important events since AMS' founding in 1970—was IBM's purchase of 10% of AMS' equity for \$18 million, in July 1989.

This investment was part of the IBM's 1989 web of strategic investments in vertical market and implementation firms in the information services industry, including:

- Computer Task Group
- MSA (now part of D&B)
- Policy Management Systems

In these investments, IBM has had a number of motivations:

- To tighten its links with SI partners in selected vertical markets
- To make sure that key providers of IBM mainframe solutions do not come under the control of parties hostile to IBM
- To accelerate the implementation of SAA in key application areas
- To add to the product development capabilities (both financial and technical) of its key partners

In the case of AMS, all of these IBM objectives played a role in IBM's decision.

What advantages does this investment have for AMS? The most prominent advantages for AMS include:

- Cooperative marketing with IBM selling AMS products and services
- IBM's "stamp of approval," which is still important for many large customers
- A multiyear service contract to assist IBM in software product development
- The potential for AMS to migrate its business even faster from the federal to the commercial sector
- Making an unfriendly takeover of AMS more difficult
- IBM's technical cooperation (and advance information) on improving the technical aspects of AMS' offerings (e.g., embedding CASE tools, increased DB2 efficiency, distributed data bases, and processing)

## 6. SI Organization

AMS' organizational structure is a complex, matrixed structure, made up of a combination of geographical, functional, vertical, and project factors. For example, AMS has 45 people with the title of Vice President. The largest differences in organization are between the federal and commercial sides of the business; the commercial side is far more decentralized, as shown in Exhibit AMS-6.

EXHIBIT AMS-6

### AMS Organization—Centralization & Decentralization by Line of Business

Task	Commercial		Federal	
	Cent.	Decent.	Cent.	Decent.
Strategy & Long-Range Planning		X	X	
Marketing & Promotion		X	X	X
Account Management/Sales		X		X
Contract Review/Approval	X	X	X	
Project Management/Control		X		X
Implementation/Development		X		X
Hardware/Software Acquisition	X	X	X	
Systems Operations		X		X

AMS has several subsidiaries in addition to its core organizations, including:

- AMS Management Systems Canada; this group has its own subsidiary, Loecus Informatics (a 1988 acquisition).
- AMS Technical Systems, designed to compete and manage long-term defense contracts
- Data Base Management Inc. (acquired in 1986); DBMI has its own subsidiary, The Courseware Developers. Both these subsidiaries provide consulting and education services.

## **7. SI Business Objectives**

AMS' business objectives are to meet the total information systems needs of its clients. To do this, AMS will provide packaged software, semi-customized software, custom software, consulting, systems integration services, and systems operation services.

Being a public company whose entire business is centered around the segments described here, AMS must make the SI business (broadly defined) as profitable as possible.

## **8. Internal SI Capabilities Evaluation**

### **a. Business Consulting**

AMS offers the following types of business consulting services:

- Planning information systems (IS) applications
- Improving business (or government) operations with computer systems technology

Generally speaking, AMS only performs business consulting that has an involvement with information services.

### **b. Design Methodology, Design and Integration, Project Management, Software Development and Education, Training and Documentation**

AMS has its own Lifecycle Productivity System (LPS) used to develop custom projects for clients. LPS is made up of a combination of third-party software and its own AMS-developed software. LPS handles all phases of the life cycle.

Part of LPS is the "CORE Foundation Software" of reusable application code modules. This helps AMS automate and control the content as well as the form of its custom applications.

### **c. Packaged Application Software**

AMS has extensive offerings of applications software, divided into the following families of software products:

- Consumer credit management systems
- Corporate and international banking systems
- Federal financial systems
- State and local government management systems
- College and university management systems

- Energy industry management systems
- Telecommunications industry management systems

As noted earlier, these application software products can be customized using AMS' own proprietary techniques.

#### **d. Packaged Systems Software**

AMS does not offer its own packaged systems software. However, as part of AMS' timesharing services—offered mainly to the federal sector—AMS does offer third-party products for use by its customers (e.g., graphics utilities and DBMS).

#### **e. Standard Computer Hardware**

AMS does not sell hardware.

#### **f. Custom Computer Hardware**

AMS does not develop custom computer hardware.

#### **g. Network Management and Operations**

AMS becomes involved in network management and operations in three primary ways:

- Through its own network, used to support its timesharing services
- Through applications that AMS has developed and subsequently operates. BureauLink is the best example of this: AMS serves as a neutral third party that manages communications and the exchange of information between the major North American credit bureaus.
- Through its products and services offered to the telecommunications industry. (See Section 4 for types of AMS customers in this segment.)

AMS, of course, develops many on-line and networked applications for its targeted customer groups.

#### **h. Service and Repair**

AMS has no significant service or repair offerings.

#### **i. Software Maintenance**

AMS has significant business in maintaining its own software products and delivered systems. In its federal business, it also maintains software written by the customer or by other contractors.

## 9. SI Strategic Alliances

Looking into the future, the IBM alliance is AMS' principal alliance (see Section 5). In the past, AMS has teamed with a number of major contractors for specific jobs; such business partners have included GTE, McDonnell Douglas, Westinghouse, and General Dynamics. AMS has generally been a subcontractor in such relationships. INPUT expects such prime/sub relationships to continue, especially where the other partner is not a direct competitor to IBM. However, as discussed earlier, the federal business will become less important to AMS over the next several years.

AMS recently entered into a joint venture with Bell Atlantic called Bell Atlantic Systems Integration. This joint venture provides Bell Atlantic's three thousand account executives with a systems integration offering that addresses opportunities requiring information processing as well as telephone products and services.

## 10. SI Capabilities Summary

AMS is rich in SI capabilities:

- It is established in a number of key markets (see Exhibits AMS-1 and AMS-2).
- AMS has a proven capability of offering the full range of services needed to cover a client's SI needs.
- AMS has a good track record in implementing complex systems.

## 11. Marketing Strategy

INPUT expects to see both IBM and AMS benefit from their partnering strategy. AMS, especially, should find that doors are now open to it that were closed before.

Even without IBM, AMS is quite well positioned. Almost half of AMS' substantial commercial business comes from its existing client base.

AMS competes with—and often cooperates with—most of the leading federal SI players; AMS often competes as a member of a team. In the commercial sector, Andersen Consulting and, to a lesser degree, the other major accounting firms are competitors.

Because of AMS' vertical orientation, it competes against other specialists:

- Firms such as Systems and Computer Technology that offer a full service approach to a particular need
- Software product firms such as Hogan or Computer Associates

## 12. SI Customer Base

AMS has a solid SI customer base. It has an important role in several large federal SI projects:

- Veterans Administration—Document and Imaging System
- U.S. Navy Paperless Ship—Shipboard Optical Disk Applications
- Department of the Interior—Minerals Management Service
- U.S. Navy—Naval Industrial Improvement Project

Although AMS indicates that it has participated in over 50 commercial SI projects since the beginning of 1987, its focus appears to have been more on providing professional services and tailored software than on being a prime contractor providing complete, integrated solutions. It has, however, increased its focus on commercial systems integration and will pursue a modest number of large SI projects.

## 13. Summary and Future Direction

AMS is one of the better-positioned SI companies, especially in commercial SI. This was no doubt a very important consideration in IBM's investment in AMS. INPUT expects to see AMS—in conjunction with IBM—mine its commercial sectors even more intensively in the future. AMS' balanced capabilities in software products, professional services, processing services, and systems operation make AMS nearly unique. (Policy Management Systems, another IBM investment, is one of the few similarly positioned companies.)

# Company Profile

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## Ameritech Information Systems (AIS)

### 1. Key SI Contacts

Charles Zito  
Vice President and General Manager  
Systems Operations  
Ameritech Information Systems  
Suite 1700  
500 West Madison  
Chicago, IL 60606

### 2. Description of Principal Business

Ameritech is one of the leading providers of telecommunications services. Created as a part of the AT&T breakup, Ameritech's primary source of revenue is the provision of telephone and data services throughout the north central part of the United States.

Ameritech Information Systems (AIS) is an unregulated, independent division, of Ameritech Corporation. AIS has been providing systems integration services for three years to the commercial sector. No work is currently done in the federal market, although Ameritech is regularly evaluating that potential.

### 3. Ameritech Competitive Position

The company has developed a number of products and capabilities that provide a competitive advantage in its market areas. The following were specifically identified:

- CASE - Design methodology
- Industry Specific Software - Clinical data base system and a common user interface for the Windows environment.
- Industry Specific Software - Integrated library system for patron and staff use.
- Connectivity Products - Network operating systems, Fax gateway, and scheduling systems.
- Connectivity Products - LAN design, development, implementation, and operation tools and procedures.

- . Hardware/Software Systems - Cross-industry application
- . Project Management Processes - Methodology applicable to all project types.
- . Network Management Products - SNMP LAN manager.
- . Automated Control of Evidence System - System to control evidence and auction management of property.
- . Computer Aided Dispatch System
- . Electronic Data Interchange Products and Services

Exhibit AIS-1 identifies the organizations that AIS considers its most significant competitors in systems integration.

Exhibit  
AIS-1

Key SI Competitors	
<i>Commercial</i>	<i>Federal</i>
Andersen	Andersen
EDS	EDS
Oracle	Deloitte Touche
IBM	

#### 4. Market Served

Like many vendors, AIS has selected a number of vertical industries as their key areas of concentration. The markets have been selected primarily on the basis of the requirements of existing clients. Key markets include:

- . Healthcare
- . Libraries
- . Education
- . State/Local Government (Public Safety)
- . Finance



In addition to the vertical market concentration, AIS has identified a number of cross-industry applications.

- . Local area networks
- . Network management
- . Electronic data interchange
- . Customer support systems
- . Imaging systems
- . Videoconferencing
- . Proprietary/open systems integration
- . Client/server architecture planning and development

#### 5. Recent Events

AIS acquired Knowledge Data Systems of Salt Lake City, Utah on January 31, 1991 for \$26 million. Knowledge Data Systems provides integrated, multi-application data processing systems and related services to health care institutions and independent medical laboratories throughout the United States.

Another recent acquisition by AIS was for NOTIS Systems, Inc. of Evanston, Illinois on October 1, 1991. NOTIS is a provider of academic library information software systems. NOTIS customers include large libraries and research institutions such as the University of Michigan and Indiana University, as well as public and corporate libraries.

Knowledge Data Systems and NOTIS Systems, Inc. will play a major role in AIS' existing efforts to further expand into the health care and library marketplaces.

#### 6. Ameritech Organization

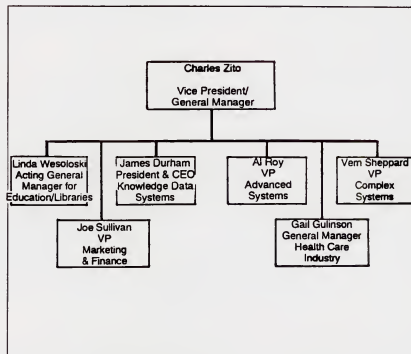
The organization is a mix of centralized and decentralized function. Planning and promotion are performed both centrally and through field staff. Hardware and software acquisition and administrative functions are performed centrally. All other activities are performed by field staff.

The company currently has 250 full time staff assigned to systems integration. Of the total, 65% are assigned to systems development, including project management and implementation activities. Fifteen percent are dedicated to sales activities and 10% are dedicated each to management and administrative activities.

Exhibit AIS-2 provides a summary of key organizational units within AIS.

Exhibit  
AIS-2

### Systems Integration Organization



#### 7. SI Objectives and Revenues

Ameritech derives 90% of its systems integration revenues as a prime contractor. The other 10% is derived by supporting client managed projects. Fifty percent of their revenue is from their existing client base and 50% is from new clients. All current revenues are derived from the commercial market.

The company reports that profit margins are stable. The greatest margins are realized on custom software development and the lowest are realized on hardware and software. All others result in margins that would be considered average.

Ameritech expects that its systems integration revenues will grow at an annual rate of over 50% for at least the next three years.

## 8. Internal SI Capabilities Evaluation

Ameritech believes that they currently have internal capabilities to perform most activities associated with systems integration. They place high value on expertise related to systems design and development, and management of large projects. They report that they have no alliances for these activities. However, they do have alliances to support customer needs for hardware, packaged application and system software, and activities such as maintenance.

## 9. SI Strategic Alliances

The company has informal, rather than formal, alliances. The primary purpose of AIS' alliances is to support joint development efforts when the vendor has a unique platform to meet a customer's needs. Their alliance program also provides a basis for technology transfer and for future planning.

Alliances are both short- and long-term. Key alliances include the following:

- . Sigma Imaging Systems - Imaging Platform
- . SpectraFax Corp. - Special request technology
- . NedAdvice - Network design and consulting
- . TELLABS - Technical information exchange
- . US Sprint - Interexchange carrier services
- . Unisys - Hardware/software
- . IBM - Hardware/software
- . DEC - Hardware/software
- . ACD - Hardware/software
- . Westinghouse - Unspecified

## 10. SI Marketing Strategy

As with most integrators, AIS derives the majority of its opportunities by leveraging work with existing clients (75%). Twenty five percent is derived from responses to proposal request.

The company does little public advertising. AIS conducts seminars and does direct mail advertising. They also participate in trade shows. Like many vendors in systems integration, particularly those in the commercial market, they place a great deal of emphasis on client reference.

### 11. SI Customer Base

Ameritech's customer base is from the commercial market exclusively. The company has no federal clients and has not expressed strong interest in entering the federal market.

The report that contract values vary considerably, but are generally in the range of \$500,000 to \$1 million each. The value of contracts is increasing and the trend is expected to continue. The company reports that 40% of the value of contracts is for professional services. Thirty percent is for equipment and packages software respectively.

Ameritech's contracts reflect the industry trend to greater distribution of system activities. The company reports that 80% of their project revenues are for distributed systems. Only 20% are for mainframe based systems.

The company reports the following systems integration projects as examples.

- . Roberts Express - Implement the migration of existing system to new, open, system environment supporting customer service, trucking and highway dispatch, two-way satellite communications and a number of administrative system processes.
- . MECA - Implementation of a public safety and public service communications system in a multi-agency and multi-jurisdictional environment.
- . IUPUI (Indiana University/Purdue University at Indianapolis) - Develop and provide a new library information system. System provides implementation plan to permit library to serve as focal point for application, demonstration, and development of present and emerging integrated technologies and information delivery.

- Chicago Transit Authority - Project to develop a metropolitan area network supporting voice, data, and video needs of the Authority's offices, rail terminals, rail stations, bus garages, and maintenance shops. Provides extensive reporting about fares and operating performance.
- SC Johnson - Develop systems architecture incorporating electronic imaging to support decentralized, financial management system.

## 12. Summary and Future Directions

Ameritech Information Systems has made a good start at entering the systems integration market. It has chosen to enter by acquisition of *niche* companies, permitting it to provide integration services in such special areas as library services and the high-potential health services area.

These capabilities, coupled with the communications integration capabilities that Ameritech has inherent in its organization, should make it attractive as an integration option for users in these areas. Both of these markets could lead to entry into the state and local arena and the insurance industry, if early successes give it the proper credentials it needs.

Ameritech's early systems integration strategy seems suited to its current market position. This should provide it the potential for market growth in the upcoming year.



## COMPANY PROFILE

### Andersen Consulting 1. Key Contacts

George Shaheen  
Managing Partner  
Andersen Consulting  
69 West Washington Street  
Chicago, IL 60602

### 2. Description of Principal Business

Andersen Consulting provides technology consulting services to clients in nearly every business and government sector. Andersen helps clients use information competitively in all phases of their management activity—strategic, operations, and financial. In September 1989 Andersen Consulting assumed the operations, activities, and personnel of the former Management Information Consulting practice of Arthur Andersen & Co., which provides accounting, audit, and tax services.

Andersen Consulting is a separate legal entity not involved in accounting or tax work. None of the partners in Arthur Andersen is an active partner in Andersen Consulting or vice versa. Both Andersen Consulting and Arthur Andersen are member firms of the Arthur Andersen Worldwide Organization (Lawrence A. Weinbach, managing partner—chief executive). An accurate description of the Arthur Andersen Worldwide Organization is “a global professional services firm.”

A breakdown of Andersen Consulting's services is as follows:

- General management consulting
- Information systems consulting
- Packaged applications software
- Computer-aided software engineering products
- Integrated solutions to business needs
- Organizational change management services

Andersen Consulting has offered management consulting services since 1948 and information services-related consulting since the early 1950s. Andersen Consulting derived \$1.4 billion of revenue from consulting services in fiscal year 1989.

Of the total revenue stream attributed to Andersen Consulting, approximately 30% can be attributed to pure professional services contracts, 65% from systems integration, and the remaining 5% to applications and systems software products. INPUT's estimate of the detailed breakout is contained in Exhibit AC-1.

## EXHIBIT AC-1

**Key Parameters Of  
Andersen Consulting's  
Consulting/SI Business**

Parameter	U.S.	Total
IS practice revenues <sup>1</sup>	\$800 M	\$1,443 M
IS practice personnel	11,000	18,000
Systems integration revenues <sup>1</sup>	\$560 M	Unknown
Systems integration practice personnel <sup>2</sup>	7,150	Unknown

1 Fiscal year August 31, 1988 to August 31, 1989.

2 Calculated by INPUT.

Andersen Consulting has been one of the most phenomenal knowledge-related businesses of the last 20 years. Revered at one moment by its competitors in the information services marketplace, and not taken seriously at others, the consulting operation has consistently shown significant growth rates and defeated the competition on a regular basis. Its commitment to the information services market has resulted in significant developments over the past several years.

In the 1986-1987 time period, a number of Arthur Andersen & Co. senior consulting partners approached Duane Kulberg, AA's former CEO, to lobby for a change in the structure of the firm that would facilitate the growth of the consulting side of the business. They argued that the traditional "partnership" structure with practice office accountability was inappropriate to a business with an increasing national and international focus. The result was the organizational change that created Andersen Consulting.

In 1987, the consulting partners in local offices began to report through a parallel line of management of regional and national consulting partners. At a national level, the consulting practice still reported to the Arthur Andersen practice head in that country—more often than not, with a background of audit. At the same time, a strengthened dotted-line



relationship was created between the country consulting heads (or regional consulting heads in the U.S.) and the Consulting Managing Partner in Chicago. This move strengthened the consulting practice significantly.

### 3. Andersen Consulting Competitive Position

Andersen's estimated \$880 million revenue in IS consulting makes it the leader among accounting/auditing/consulting firms in this segment.

Andersen Consulting's strengths include contacts at the vice-presidential or presidential level at customer companies. In fact, each IS partner is expected to be able to contact senior officers at their top accounts. In addition, Andersen Consulting offers extensive in-house staff training and has a strong services-oriented culture. AC has developed a variety of strong third-party hardware and software vendor relationships to support it in its information services consulting business.

INPUT does not believe that AC has any significant weaknesses. However, some problems do exist. First, AC's partnership culture has traditionally worked against change. However, recent developments within the organization are likely to minimize the effect of this problem. Second, AC's approach to systems integration has been heavily business-process-oriented. Top down in nature, the approach is not suitable for every client. Finally, AC's strengths in the international component of the IS/SI market have significantly lagged behind the U.S. operation's. However, AC is rapidly building these capabilities. Exhibit AC-2 summarizes INPUT's assessment of competitive strengths and weaknesses as they apply to the systems integration business.

EXHIBIT AC-2

#### Andersen Consulting's Competitive Status

SI Strengths	SI Weaknesses
High-level client contacts	Partnership culture
In-house training capability	Process orientation
"Professional services culture"	Foreign SI capabilities
Strong third-party relationships	

#### 4. Markets Served

Andersen Consulting's systems integration business focuses almost exclusively on vertical markets, but in effect covers almost all of the commercial and government sectors, including:

- State and local government
- Manufacturing
- Wholesale and retail distribution
- Financial services
- Health care
- Insurance
- Utilities
- Process manufacturing
- Transportation
- Telecommunications
- Energy and gas
- Federal government

Although AC has clearly demonstrated capability in all the markets listed, from a historical perspective INPUT believes that AC's primary focus in these vertical industries in order of importance has been: manufacturing, distribution, state and local government, financial services, and telecommunications.

Furthermore, although many competitors consider Andersen Consulting "invisible" in the federal SI marketplace, AC has recently placed significant emphasis on developing business in that arena. Most likely, the "invisibility" is more a function of the types of systems it does—primarily administrative as opposed to the more-publicized defense contracts.

#### 5. Recent Events

A number of significant events have impacted Andersen Consulting's position in the SI market over the past three years.

- AC has placed significant emphasis on the development of alliances in the software community, including: UCCEL/CAI, Management Science America (MSA), McCormack & Dodge, IBM, and SAP (West German cross-industry financial packages).
- On the hardware side, alliances have been formed with IBM, DEC, Hewlett-Packard (HP), Sun Microsystems, Texas Instruments, Pyramid Technology, AT&T, Tandem, and Motorola. In February of 1988, AC and Aetna Life & Casualty signed a joint development and marketing pact for investment accounting software running on DEC/VAX hardware.

- AC has also focused on the development and aggressive marketing of its own software products, including: FOUNDATION (Software Development Utility), DCS/Logistics (Distribution Control System), and the "MAC-PAC" line of integrated manufacturing software packages.
- Andersen Consulting also has developed a number of relationships as a preferred installer of others' vertical industry software which AC customizes and includes in SI projects. AC currently operates as a preferred installer in the insurance, utilities, retail, financial, services, and state and local government industries.
- Andersen Consulting made a number of acquisitions during 1989.

Acquisitions include the following:

- In September 1989, Andersen Consulting acquired Rossmore Warwick, a 25-30 person British engineering firm that helps design new factories and new process lines.
- In July 1989, Andersen Consulting acquired Courseware, Inc. of San Diego (CA). Terms of the acquisition were not disclosed.
  - Courseware provides computer-based training and training support services to clients in insurance, data processing, communications, real estate, defense, aerospace, and travel, as well as state and federal government. The company had 60 employees at the time of the acquisition and 1988 gross fees of \$5.2 million.
  - The operations of Courseware have been merged into Andersen Consulting's Change Management Services (CMS) practice.
- In January 1989, Andersen Consulting acquired McCormack & Dodge's PIOS manufacturing resource planning system. McCormack & Dodge employees who had worked on PIOS development and marketing were offered positions with Andersen Consulting. Terms of the purchase were not disclosed.
  - With an installed base of 75 sites, PIOS is used by a number of large defense contractors.
  - The transaction is part of an agreement between McCormack & Dodge and Andersen Consulting under which the two firms will jointly sell McCormack & Dodge's Millennium financial and human resources software and Andersen Consulting's MACPAC family of manufacturing software products.

- Other 1989 acquisitions include:
  - Computer Management Associates, a consulting firm in Oslo (Norway)
  - Synerlogic, a Canadian consulting firm
  - CMC Consultores, a Spanish consulting firm

But perhaps the most significant developments for Andersen Consulting have been in the ongoing saga of its restructuring to support the information services and systems integration marketplaces. As discussed earlier (Section 2), the formation of Andersen Consulting represented an important change in the firm's outlook on the consulting/IS/SI business.

Andersen's growth has not been painless. During the last two years, a number of key systems integration management personnel have left to start new companies or strengthen competitors.

In 1988 several senior partners departed Andersen Consulting to form another firm, Information Consulting Group, financed by Saatchi and Saatchi. Though this venture was not successful, and has since been purchased by McKinsey and Co., it drained Andersen's technical and management talent.

In 1989, Mel Bergstein, a senior Andersen Consulting partner, joined Computer Science Corporation (CSC) and has become Senior Vice President of systems integration. Two additional key partners joined him at CSC.

In July 1990 the Securities and Exchange Commission ruled that Andersen Consulting could partner with the firm's audit clients. This permits the firm to establish alliances with audit clients such as Oracle or Amdahl.

Exhibit AC-3 summarizes major recent events impacting Andersen Consulting's position in the SI marketplace.

## EXHIBIT AC-3

**Andersen Consulting—  
Major Recent Developments**

- Extensive formation of software alliances
- Aggressive formation of hardware alliances
- Development/promotion of internally developed software
- Reorganization to support SI/IS business

**6. Organization**

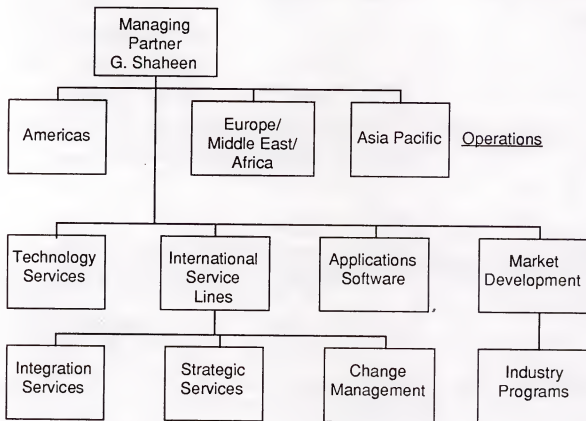
Andersen Consulting manages and delivers its services through the matrixed structure depicted in Exhibit AC-4. The organization is headed by George Shaheen. Reporting to him are managing partners with operational responsibility for three major geographic areas: the Americas, EMEA (Europe, Middle East, and Africa), and the Asia and Pacific area. These partners have responsibility for delivering all of AC's services to their clients.

Also reporting to Mr. Shaheen is a managing partner of international service lines who has responsibility for establishing strategies and plans for each of AC's major offerings—integration services, change management, and strategic services.

Strategic Services assists clients in forming and managing their, strategic planning processes. Included are services that analyze the client's marketplace and competitive position, identify strategic alternatives, establish a formal direction and monitor the execution of strategies.

The Change Management Services practice works with organizations to position people, processes and technology for maximum continuous benefit. These services focus on organizational structure, knowledge transfer and the integrated use of technology. Integration services includes two major components—systems integration and systems management. System integration includes the full range of development and integration activities; system management includes facilities management and remote processing. By including these two activities in a single organization, Andersen Consulting provides complete life cycle development and operations services.

EXHIBIT AC-4

**Andersen Consulting Organizational Structure**

- Systems Integration
- Systems Management

Additional areas that report to Mr. Shaheen include Technology Services, responsible for technical excellence (including products such as FOUNDATION), Application Software, responsible for building and maintaining Andersen's application software packages, and Market Development.

Based on INPUT's interviews with Andersen Consulting, responsibilities are distributed in accordance with Exhibit AC-5, which compares how major responsibilities are managed within the commercial and federal organizations, respectively. A "C" indicates that the responsibility for the activity in question is primarily centralized, a "D" means decentralized, and a "B" indicates that the responsibility is shared by both.

## EXHIBIT AC-5

**Centralization/Decentralization  
of SI Business Function  
Andersen Consulting**

Responsibilities	Commercial	Federal
Strategy and long-range planning	C	C
Marketing and promotion	B	C
Account management/sales	D	D
Contract review/approval	B	C
Project management/control	D	D
Implementation/development	D	D
Hardware/software acquisition	B	B
Systems operations (if applicable)	D	D

C = Centralized, D = Decentralized, B = Both

Centralized groups handle marketing, risk management assessment insurance, national contract purchasing, and other activities. Local offices provide the sales emphasis and most of the technical professionals necessary for systems integration projects.

Andersen Consulting has established a number of System Operations, Advanced Technology, and Business Integration Centers to support its activities.

- There are five Systems Operations Centers, which are large mainframe computer facilities staffed with project teams to run the day-to-day computer operations for an organization. These centers are located in Chicago, Dallas, London, Toronto, and Stamford (CT).

- Advanced Technology Centers are staffed with technical experts and project managers who use workstations and network PCs connected to these centers for the automation of the application development process for clients. Advanced Technology Centers are located in Chicago, Dallas, Madrid, Manila, and Stamford (CT).
- Andersen Consulting currently has four sites for its Business Integration Centers which specialize in industry- and function-specific technology. These centers serve as facilities where industry project teams from around the world build and demonstrate visions of the future through full-scale working technology exhibits (e.g., a factory floor or hospital of the future).
  - Business Integration Centers are located in Chicago, Dallas, Atlanta, and Sao Paulo.
  - At one Business Integration Center, Andersen Consulting has designed a minifactory (located in Chicago, IL) that displays CIM techniques. The minifactory integrates the products from 35 different companies and produces an aluminum casting that holds a printed circuit board and plastic connectors.

Other technologies in the Chicago center include expert systems, voice recognition, vision systems, Ethernet and MAP 2.1, personal workstations, touch screens, computer-aided design, computer-aided manufacturing, MRPII, group technology, robotics, material handling, cell control, computer numerical control, and bar code data collection.

- A second Business Integration Center, also located in Chicago, contains SMART STORE 2000, a showcase of Andersen Consulting's vision for the food pipeline process through the retailer. The exhibit incorporates state-of-the-art hardware and software applied by more than 40 participating vendors and addresses food industry management concerns about the future.
- Andersen's LOGISTICS/2000 exhibit, in Atlanta, demonstrates how the integration of technology can benefit a logistics organization. It includes an automated warehouse and offices for sales and customer service, inventory management, transportation management, and executive management.
- Another Business Integration Center, Hospital of the Future, represents Andersen Consulting's vision of the systems technologies that will support the health care delivery system of the 1990s. Located in Dallas, the exhibit will serve as a permanent site for Andersen Consulting and more than 20 participating vendors.



- Also located at the Dallas Infomart are AC—The Retail Place, The Factory, ACES, and GEO-PLUS. The Retail Place is Andersen Consulting's fully operational Quick Response retail store. The exhibit demonstrates how Quick Response establishes new business strategies, relationships, and procedures to speed the flow of information and merchandise between retailers and vendors. The Factory is a working factory that shows manufacturing automation from order entry through distribution. ACES is Andersen Consulting's Engineering Systems exhibit, highlighting imaging technologies and document management functions applicable to a manufacturer as well as a financial service, insurance, or pharmaceutical company. GEO-PLUS demonstrates geographical mapping solutions.

Andersen Consulting reports a full-time worldwide IS practice staff of 18,000. INPUT estimates that 7,150 of the 11,000 individuals involved directly in the U.S. information systems consulting practice are directly involved in the SI practice. This number is based on the percentage of 1989 U.S. systems integration revenues. Exhibit AC-6 gives an indication of the distribution of resources between various SI-related activities.

EXHIBIT AC-6

**Distribution of  
SI Business Personnel  
Andersen Consulting**

Capability	Percent
Management, strategy, planning, marketing	1
Legal/contract administration, finance	1
Project management and administration	5
Design/development/implementation	83
Hardware/software evaluation/acquisition	5
Hardware engineering	1
Sales	4

## 7. SI Business Objectives

Andersen Consulting wants to gain and maintain position by being the preeminent provider of solutions to "top" organizations worldwide. The focus is strictly on partnering to provide solutions. Although not explicitly stated in the interview process, INPUT believes that Andersen Consulting sees itself as taking leadership as the "respected consultant/provider of strategic information systems."

From a business perspective, Andersen Consulting sees the revenue and profits from systems integration as a primary motivator for development of the business, along with control of account base and the need to respond effectively to existing and new customer demand. As would be expected, "dragging" hardware and follow-on facilities management contracts are not of primary interest, although the latter has become more important as competition with IBM and EDS becomes more intense.

## 8. SI Capabilities Evaluation

And as might be expected, Andersen Consulting has a full in-house capability at the high end of the development life cycle, and also as might be expected, makes heavy use of alliances in the areas of systems software, hardware, custom and communications hardware, and hardware maintenance. A summary of its capabilities follows:

- Business Consulting, Design, and Project Management—Clearly this is the area of Andersen Consulting's strength. The combination of a solid methodology along with uniform and effective training of its personnel produces consistent, if not always exceptional results. Consistent with the professional services orientation of the firm, education, training, and documentation are also significant skills that it markets heavily as part of its capabilities.

It is interesting to note, but not surprising, that Andersen Consulting indicated that it uses no alliances in these capability areas. It should be noted, however, that its recent acquisition activity, particularly in the non-U.S. includes a number of consulting firms.

- Packaged Applications Software—This is clearly an area of strength for AC. It has made significant investments in the development of numerous packages. (See Section 5 and Exhibit AC-7.) The aggressive marketing of these packages, along with the development and utilization of strong alliances to fill the gaps, gives Andersen Consulting a very strong position within its competitive group in the applications software area.

## EXHIBIT AC-7

**Andersen Consulting—  
Applications Software Products  
Some Examples**

Product	Description
MAC-PAC	MRP-II product linking plant automation and manufacturing software. Several other MAC-PAC packages run within this series for specialized applications such as defense contracting.
DCS/Logistics	Manages customer service and logistics functions.
FOUNDATION	A comprehensive set of packages to manage the systems life cycle, which includes submodules METHOD/1, DESIGN/1, and INSTALL/1.
PIOS	(Production and Inventory Optimization System) On-line manufacturing control system acquired from McCormack & Dodge.
CELL-PAC	Factory floor cell control software

- **Systems Software/Computer and Communications Hardware**—This is an area where Andersen Consulting consistently utilizes other vendors' products, most often through alliances. AC wants to be perceived as, and most likely is, unbiased in its selection of hardware and systems software.
- **Network Management/Operations**—Although AC does have some contracts in which it performs these functions, this area is neither a primary focus of business nor an area of strength. Because of the long-term importance of networks to worldwide business solutions, AC recently announced an alliance with Infonet, which has worldwide networking capability.

INPUT believes that overall, Andersen Consulting has significant capabilities in the areas that are most important for winning and executing SI contracts. Its focus on the top end of the life cycle and perceived strengths in understanding business solutions in many industry sectors gives it an edge on the market that few others have.

## 9. SI Strategic Alliances

Andersen Consulting has established some significant alliances that strengthen the firm's SI capabilities. As with most other major systems integrators, AC utilizes both long-term and project-by-project alliances. AC believes that the use of alliances supports its strategy for SI by:

- Providing hardware at competitive prices
- Giving it early access to new technologies
- Providing assistance in financing projects
- Supplementing areas where it has limited internal capability, such as maintenance support and worldwide telecommunications.

The majority of its longer-term alliances have evolved from working with particular subcontractors or partners on a repetitive basis. Other alliances have developed as a result of Andersen's strategy to develop industry-specific software.

The alliances with hardware manufacturers—Hewlett-Packard, for distribution and marketing applications, and IBM—effectively support AC's thrust into financial and manufacturing markets. AC works with DEC as well. Exhibit AC-8 provides examples of AC's strategic alliances in systems integration.

## 10. SI Capabilities Summary

Andersen Consulting's strengths far outweigh its weaknesses as a systems integrator. In fact, its strong set of capabilities in the high end of the life cycle serves to reduce significantly its dependencies on outside suppliers for the high-risk elements of most SI contracts. Its strengths in software development, project management, and packaged systems and applications software have contributed measurably to the firm's success. The weaknesses in service and repair and, to some degree, design integration, are not critical to success in the business, particularly in the vertical markets where Andersen Consulting has focused.

AC's alliances and applications software offerings also add significantly to its overall capabilities. AC's MAC-PAC (Integrated Manufacturing) and DCS Logistics (Distribution Control System) are good examples of the latter. And, the FOUNDATION development and implementation methodology is probably the best-known package of its type in the industry.

## EXHIBIT AC-8

**Andersen Consulting—SI Strategic Alliances  
(Limited Sample)**

Product	Description
Hardware	IBM Hewlett-Packard Pyramid Technology DEC Tandem Sun Microsystems Texas Instruments AT&T Motorola
Applications Software	UCCEL/CAI MSA McCormack & Dodge SAP (Financial) Inference Corporation IBM American Software
Systems Software	IBM AION (Expert Systems)
Cooperative Marketing	Aetna (Insurance)
Networking/ Telecommunications	Infonet

Finally, Andersen Consulting has always placed heavy emphasis on training. Utilizing its internal training and development capabilities, Andersen Consulting has adopted a strategy of consistent development of its staff. Therefore, AC professional personnel understand the processes used in acquiring and executing the business and can be deployed in the organization when and where needed. The resulting consistency from understanding the approach facilitates the effective deployment of personnel in SI efforts and is a great asset. Andersen states that it will spend approximately \$7,600 on each consulting professional for internal training in fiscal year 1990—a total cost of \$137 million.

## 11. SI Marketing Strategy

The backbone of Andersen Consulting's marketing approach is its vertical business focus and business process orientation (See Section 4). The process is targeted at developing high-level business solutions and converting them into the application of information technology. AC was one of the first, and clearly is one of the most successful, systems integrators to approach the "strategic systems" market. The AC "process" is at the heart of each project. AC understands the value of developing relationships with high-level managers in target firms and industries and very effectively utilizes referral selling at these levels. AC's demonstrated capability of dealing with projects over \$50 million makes it one of the few commercial systems integrators that can make that claim.

In addition, as part of its marketing process, AC has developed and utilizes four Business Integration Centers which feature its product offerings. The Chicago, IL center for CIM and JIT manufacturing environments could be considered a "showcase" example.

- **Competitors:** Andersen Consulting sees IBM and EDS as its prime competitors. In the federal marketplace, it adds CSC to that list. As AC broadens its targets to smaller systems opportunities, it will undoubtedly find a few more competitors.
- **Positioning:** AC's primary positioning with customers/prospects is to promote its ability to apply information technology to achieve competitive advantage. AC uses this consistent theme in combination with its in-depth vertical industry expertise to present itself as the number-one seller of business solutions. AC has invested heavily in recent years in developing its technological expertise. Though this is still not a primary positioning point, it certainly plays a role when presenting the entire package to the customer. INPUT believes these capabilities will become more significant in the future.
- **Promotion:** Andersen Consulting uses essentially all forms of promotion for its SI market strategy, even network television. However, AC indicates that the jury is out on all approaches except qualified client referrals, direct marketing, and utilization of the Business Integration Centers, which it rates as highly effective. In addition, AC utilizes public seminars with some degree of success.

Finally, INPUT believes that Andersen Consulting enjoys a somewhat unique marketing position among leading systems integrators which is worthy of comment. AC frequently "writes" the RFP, at least in the figurative sense. AC's business consulting skills often give it entry to the prospect's environment long before a solution or even, at times, the problem, has been defined. Operating from a high-level position as a consultant and supported by the FOUNDATION methodology, AC has

often closed the business before it has been opened. As a full-service provider, AC is a logical selection for implementor once the consulting is done. Exhibit AC-9 summarizes Andersen Consulting's marketing strategy.

**EXHIBIT AC-9****Andersen Consulting Marketing Strategy**

- Direct marketing/business processes
- Strong methodology
- Vertical market focus for commercial marketplace
- Primary competitors: IBM, EDS, CSC
- Positioning: strategic systems, business expertise
- Promotion: referral, technology centers

**12. SI Customer Base/Specific Projects**

Andersen Consulting reports that about 80% of its commercial systems integration clients come from its existing account base and about 20% from new prospects specifically solicited for SI. In the federal marketplace, the split is 50% from each source. Undoubtedly, the high percentage of repeat business in the commercial market reflects AC's long-term account relationships with larger firms, while the 50/50 split in the federal market is indicative of its more recent entry into that marketplace and the fact that the federal market is more RFP-driven. In both markets, AC claims that its business has been profitable.

In recent years, AC has moved from a position of mainly pursuing very large projects to soliciting smaller ones as well. INPUT estimates that AC wins almost 60% of the projects it actively bids on; and it has completed projects ranging from \$2 million to \$80 million (average size about \$10 million). AC's top commercial customers are concentrated in discrete and process manufacturing, telecommunications, state and local government, banking and insurance, airlines, and the federal government.

Although Andersen Consulting did not provide a list of specific projects, Exhibit AC-10 contains information on some of AC's key SI engagements.



EXHIBIT AC-10

**Examples of Andersen Consulting's  
SI Contracts**

Company or Industry	Project Description	\$ Millions
Lockheed	Computer-aided layout/fabrication	3.0
Ashland Chemical	Order entry/inventory control	5.5
Ca. Dept./Development Services	Cost recovery system	3.6
Social Security Administration	Integrated administrative and financial system	12.0
Electronics Industry	Circuit Board Test and Assembly	52.0
Utility Industry	On-line billing system	30.0
Retail Industry	Finance, inventory, and sales	10.0
Northwest Airlines	Revenue accounting	N/A
Paris Bourse	Stock exchange clearing and settlement	N/A
Swiss Options and Financial Futures Exchange	To plan and implement electronic clearing and settlement system	N/A



### 13. Summary and Future Directions

Andersen Consulting has an excellent overall image as a systems integrator. Strengths include its ability to manage the client's planning process, the resources to handle very large projects, and its focus on professional services. Its ongoing investments in key applications software products and the continued development and education of its professional staff will continue to build the positive momentum it has in the marketplace.

Not to be overlooked on the positive side is AC's ability to formulate client requirements. Focusing on the high end of the life cycle, AC frequently "writes" the RFP, so to speak—a position that many of its competitors should envy. The result is a very high success rate in winning contracts, which minimizes marketing and bid preparation costs.

In those areas where Andersen Consulting might be perceived as being weak, there are plans in place.

- The inherent problem with the decentralized partnership profit center structure is being addressed by the recent round of reorganizations.
- The "by the book" (perceived by some as overly structured) approach to design and engineering is fading as higher-level and better-trained consultants enter the SI practice.
- A weak technical image is being overcome by heavy investment in proprietary technology.

The future looks bright for Andersen Consulting. INPUT expects its market approach to become more aggressive as the reorganization of the consulting activity falls into place. INPUT anticipates increased focus on Europe and Asia. In addition, the market can anticipate further heavy investments by AC in technology to support both vertical and, to a lesser extent, cross-industry markets.



In its positioning, AT&T has great advantage as the world's leading authority on telecommunications services and network management.

## 12. SI Customer Base

AT&T's most significant contract for 1989 is the federal government's FTS-2000 contract to provide switched voice, switched data, packet switching, video transmission, switched digital integrated and dedicated transmission, and other services. In its final form, AT&T won 60% of a three-year, \$450 million, revenue guarantee (U.S. Sprint won the other 40%). This is a level-of-service contract; thus, under this contract, the federal government will not lease additional circuits or purchase any hardware or facilities to support FTS-2000. Some of AT&T's SI contracts are identified in Exhibit ATT-5.

EXHIBIT ATT-5

### Examples of AT&T's SI Projects

Company/Industry	Project Description	\$ Millions
Transportation Dept., U.S.	Office Automation	Unknown
Chrysler Financial	Open Systems Platform in SNA Environment	Unknown
Amtrak	Ticket Agent Automation	Unknown
American Airlines	Travel Agent Automation	Unknown
Hyatt Hotels	Property Management/ Central Reservation Systems	Unknown

Since the beginning of 1988, AT&T indicated that it has undertaken approximately 200 commercial SI contracts and 10 federal SI contracts. AT&T would not disclose an average value of its SI contracts.

## 13. Summary and Future Directions

AT&T's most significant strengths are its capabilities and technical expertise in large-scale telecommunications. Few, if any, of its competitors can match AT&T in this area. AT&T has extensive resources to meet most needs relevant to the design, development, and management of telecommunications services; and it has a large nationwide customer base

to market its SI services to. Also, AT&T has begun to form meaningful, long-term relationships with other manufacturers and services vendors that complement AT&T's capabilities and strengthen its competitive stance.

AT&T, however, has limited experience in designing, developing, implementing, and operating major applications software systems. The newly-increased number of significant alliances AT&T has entered into should help to fill out AT&T's capabilities and make it an ever more credible competitor in all areas of commercial and federal systems integration.

AT&T's recent interest in acquiring NCR suggests that AT&T should not be considered either a niche-market participant or even primarily a telecommunications services and facilities provider. Rather, it now appears that AT&T intends to compete fully in all aspects, including the SI segment of the information systems market.

With its economic strength, its depth of telecommunications expertise and growing breadth of capabilities augmented by its alliances, AT&T must be considered a major participant in the SI market. If AT&T succeeds in acquiring NCR and manages to combine their respective strengths, AT&T could become a dominant participant in the banking and retail SI markets and in other segments of the information services and products markets.

## COMPANY PROFILE

### Bechtel Information Technology

#### 1. Key Contacts

Mr. H. W. Howard  
Vice President & Manager  
Bechtel Information Technology  
P.O. Box 3965  
San Francisco, CA 94119

#### 2. Background and Current Status

Bechtel has been a world leader in engineering and construction for more than 80 years. Operating on a worldwide basis, the company has demonstrated the capability to undertake major projects from airports to bridges with competent project management and the ability to estimate and absorb risk.

As might be expected, over the past decade the company has been increasingly involved with the systems aspects of facilities and other projects that have come under its management. As these aspects of the company's engineering projects have become more critical, Bechtel has built a substantial set of in-house capabilities in the area of information systems and has developed (almost out of necessity) several areas of information systems expertise unique to its primary line of business.

Bechtel has been undertaking specialized SI projects since about 1970. The company is presently in the process of determining its future approach to the market. Whether Bechtel will invest the resources required to leverage its current position and experience is still in question. Certainly, Bechtel has the capabilities and financial resources to do so. The real issue is how far the parent organization will want to stray from its traditional lines of business in order reap the potential profits available from leveraging its systems capabilities.

#### 3. Organization and Market Participation

The primary focus for Bechtel's participation in the SI marketplace is Bechtel Information Technology, under the leadership of Bill Howard. (At the moment there is no dedicated organization to support the external effort.) Bill has been the primary thrust for formulating a business plan that could make Bechtel a major player in specialized markets.

His current organization provides centralized information services to Bechtel's other lines of business, in addition to bidding and executing SI projects outside of the Bechtel family of businesses. Despite the split

focus, Bechtel has a significant number of personnel dedicated or available to participate in systems integration and has an established track record in the business. Details are presented in Exhibit BEC-1.

## EXHIBIT BEC-1

**Parameters Of Bechtel's SI Business**

Full time commercial SI staff	200
Average additional commercial staff	200
Full-time federal SI staff	6
Average additional federal staff	200
Projects started or completed since 1987	10 - 20
Annual revenues from systems integration	\$40M

Strategy and long-range planning for participation in the SI market are centralized at Bechtel. All remaining aspects of the business are either shared by the central organization with decentralized units or managed totally on a decentralized basis. Consistent with the management of the company's primary business, project management and implementation are handled on a decentralized basis.

Bechtel deploys about 70% of the resources available for systems integration in development and implementation, about 10% in project management, 10% in hardware/software acquisition, 5% in sales, and the remainder in management and administration. In that sense, it operates with a profile similar to those of professional services companies active in the market.

**4. SI Capabilities Summary**

As shown in Exhibit BEC-2, Bechtel's primary capabilities lie in two areas, project management and technical skills. The company has strong systems development resources, including a programming staff in excess of 500 and a variety of specialized technical capabilities that are clearly applicable to Bechtel's selected market niches. (See Section 5 for market niche information.) These capabilities include:

## EXHIBIT BEC-2

**Summary Of Bechtel's  
SI Capabilities**

1. Proven capability in engineering integration
2. Specialized technical capabilities  
  
Expert systems/artificial intelligence  
image processing and records management  
integration experience with CAD/CAE
3. Large development staff with strengths in  
data base and networking applications
4. Project and risk management methodologies

- Significant specialized capability in image processing and records management developed through Bechtel's work with the utilities and nuclear industries. This is clearly an area where Bechtel has unique skills that have already lead to outside contracts.
- Strengths in CAD/CAE that have already been applied to a number of SI projects.
- Substantial investments in the area of expert and advanced systems. The company currently owns Technology Applications, Inc., which has a professional staff of 40 focused in this area that, when combined with its in-house organization, amounts to a total of 80 professionals in the expert systems area.
- Over 100 professionals dedicated to networking and telecommunications, and proven data base skills with IMS, DB2, and Oracle.

Finally, Bechtel has developed unique tools and a methodology that it believes gives it a competitive advantage in the areas of project and risk management.

## 5. Marketing Strategy and Approach

The primary motivators for Bechtel's participation in the SI market are not surprising considering the company's background. Bechtel sees an opportunity to make profit from the management, design, and implementation of major integration efforts as its primary objective. In addition, Bechtel is under increasing pressure to respond to current customer demands that represent 90% of the company's SI business. Finally, Bechtel sees substantial opportunities in the follow-on business of systems operations.

Bechtel's market orientation is primarily vertical and evolved from the company's traditional lines of business. Primary targets are in the process manufacturing and government sectors as follows:

- Utilities
- Petrochemical industries
- Food processing
- Mining and metals
- Federal government
- State and local government

Although Bechtel would not comment specifically on competition, INPUT believes that in the markets Bechtel has selected, it is likely to be up against IBM, DEC, EDS, and Computer Sciences on a regular basis. Its participation in the utilities market will also make it a competitor of CDC.

Bechtel does make use of alliances in the execution of its SI engagements, but has no formal program for the development of long-term formal relationships. Long accustomed to assembling the right subcontractors for getting its traditional business done, Bechtel is probably quite effective in obtaining and managing subcontractor/alliance relationships on a contract-by-contract basis.

### a. Positioning and Promotion

Bechtel positions itself as strong in project management capabilities and heavy on technical expertise, leveraging the many specialized capabilities outlined in Section 4. In the vertical industries that it has selected, it can also argue its industry expertise. In addition, the company promotes its strong financial position and proven track record for design and integration in the construction business.

The company makes use of public seminars, direct mail, advertising, and trade publications in promoting its capabilities. However, like most other market participants, Bechtel finds that client referrals and industry



word of mouth are the most effective means of identifying and capturing new opportunities; the company has become disenchanted with bidding blind on RFPs for clients with which it has no relationship.

#### **b. Customer Base/Specific Projects**

The only project that Bechtel would comment on was recently signed with the Securities Exchange Commission (SEC). The project will utilize Bechtel's technology and experience with records management to handle over 12 million records per year.

### **6. Summary and Future Directions**

Clearly Bechtel has the financial and technical resources to be a strong niche competitor in the systems integration market. The company has also assembled an impressive array of specialized technical skills and proven expertise in areas that should make it the vendor of choice for a significant subset of integration projects in its target industries.

The primary problems that Bechtel must face have to do with commitment to business and marketing. Specifically, although Bechtel Information Technology seems clearly committed to moving forward in the systems integration market, the powerful Bechtel management committee seems more tentative about SI business prospects. For the strategy to succeed, Bechtel's top management will need to make the fledgling information services business operate on an equal footing with the other major operating divisions. To date, this equality has not happened. As a result:

- Many of the critical skills and capabilities described previously are scattered throughout the corporation's existing major business units and must be assembled on a project-by-project basis in order to bid and fulfill an SI engagement. It's not clear that the other operating divisions are willing to give an equal priority to Bechtel Information Technology's needs.
- It also appears that to some degree the existing major business units may see SI as an opportunity to leverage their internal systems expertise as a secondary line of business, thus in effect competing with Bechtel Information Technology for SI market opportunities.

Marketing is another area in need of development. At present, some 90% of Bechtel's SI opportunities have come from its existing clients, which is typical of a reactive market posture. Clearly there needs to be more development of a proactive marketing and sales strategy.

INPUT's impression of Bechtel's strengths and weaknesses as a systems integration vendor are presented in Exhibit BEC-3.

## EXHIBIT BEC-3

**Bechtel's Strengths and Weaknesses in SI**

Strengths	Weaknesses
Existing client base	Commitment to business
Specialized Technical Expertise	Marketing/sales strategy
Project management capabilities	
Financial strength/reputation	

## COMPANY PROFILE

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### Boeing Computer Services

#### 1. Key SI Contacts

Michael R. Hallman  
President  
Boeing Computer Services  
2810 160th Avenue, S. E.  
Bellevue, WA 98008

O. M. Landahl  
Vice President/Deputy Manager  
Information Services  
2810 160th Avenue, S. E.  
Bellevue, WA 98008

R.M. Little  
Vice President/Deputy Manager  
Information Services  
10800 Parkridge Boulevard  
Reston, VA 22091-5418

#### Federal

George Coulbourn  
General Manager  
Government Business Development  
10800 Parkridge Boulevard  
Reston, VA 22091-5418

#### Commercial

Doug Smith  
General Manager  
Commercial Information Services  
2810 160th Avenue, S.E.  
Bellevue, WA 98008

#### 2. Description of Principal Business

Boeing Computer Services (BCS), a division of the Boeing Company, supplies computing and communication resources and information services to all Boeing operating divisions, and to more than 1,500 government and commercial customers worldwide.

BCS was established in May 1970 to consolidate 13 separate computing organizations within Boeing. The division began with about \$250 million worth of computing equipment and a staff of 2,700.

Today, BCS employs more than 13,000 people located throughout the U.S. and other countries, and manages approximately \$1.4 billion worth of company-owned computing and telecommunications equipment.

BCS is currently divided into two major groups:

- **Information Services**—BCS' current noncaptive business focuses on providing strategic systems development and integration products and services to government and commercial clients. The division also provides network integration and management products and services, document and image management products and services, remote computing services (including supercomputing), systems operations services, consulting services, packaged software products, and education and training services.
- **Boeing Support Group**—Over \$1.1 billion in information services support is supplied annually to the Boeing Company and its operating divisions by the Boeing Support Group (BSG). The Advanced Technology Center, which has been a pioneer in areas such as artificial intelligence and supercomputing, is also managed by BSG.

In 1989, BCS realized significant revenues from its systems integration (SI) business, focused mainly on the federal market, as shown in Exhibit BCS-1. The company also positioned itself in the commercial SI market. BCS' 1989 noncaptive revenue is estimated at approximately \$360 million, a 30% increase over estimated 1988 noncaptive revenue of \$275 million.

EXHIBIT BCS-1

**BCS**  
**Systems Integration Revenues, 1989**

Business Component	\$ Millions*
Federal	215
Commercial	35

\*Estimated

### 3. Competitive Position

Boeing Computer Services has significant strength in a number of areas that include systems and network design, integration, and management. One of BCS' key strengths is its ability to draw upon a highly technical staff of approximately 13,000. Areas of technical specialization include:

- Systems design, integration, and management
- Network design, integration, and management
- Document management
- Image processing
- Artificial intelligence
- Supercomputing
- Facilities management and systems operation
- Program planning, management, and control
- Education and training

As a provider of SI services, BCS has a strong computer services base and a broad base of skills from which to draw. See Exhibit BCS-2. BCS is also strong in applied research, such as the application of artificial intelligence. BCS is able to demonstrate many of these skills through its Telecommunications Management Center, data centers, and nationwide networks.

EXHIBIT BCS-2

### BCS Strengths and Weaknesses

#### Strengths

- Broad computer services base
- Broad network services base
- Broad skills base
- Strong project management base
- Strong applied research

#### Weaknesses

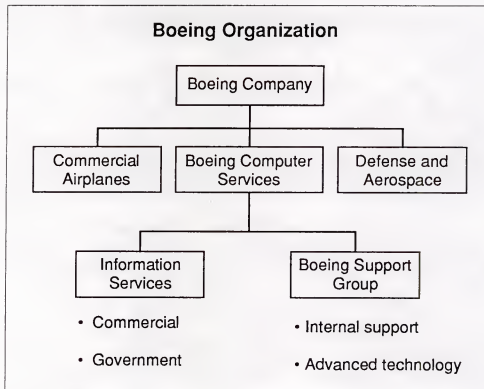
- Historical federal focus
- Historical parent company focus

Early in its history, BCS became a major player in the commercial timesharing market. Next, the company placed emphasis on becoming a major participant in the federal integration programs arena, while at the same time deemphasizing its interest in the commercial marketplace. Reorganization of the division in 1989 has shifted resources to building the commercial systems integration business into a major contributing

entity. To date, BCS' commercial activity has been limited to key vertical market niches such as aerospace and state and local government. However, the company has recently branched out into new areas, including transportation, electronics, and utilities.

The president of BCS has always reported directly to the president of Boeing. A 1989 reorganization of the defense and aerospace businesses within Boeing reduced the number of executives who report directly to the Boeing president. The current Boeing organizational structure is shown in Exhibit BCS-3. This structure allows the BCS division even more visibility within the corporate structure and shows the high-level strategic importance of BCS, both internally within Boeing and externally as a commercial enterprise.

EXHIBIT BCS-3



#### 4. Markets Served

Approximately 85% of BCS' 1989 noncaptive revenue was derived from the federal government, and 15% from commercial clients. Noncaptive revenue excludes that derived from the parent company, which is BCS' principal customer. Within the government, BCS pursues business—including SI, support services, and telecommunications business—for the Department of Defense, NASA, and various civilian agencies. Commercial revenue comes primarily from the manufacturing, energy, and transportation industries, state and local government, and from cross-industry applications. New vertical markets, including pharmaceuticals, financial services, and electronics, are evaluated in response to market demand.

BCS operates six major data centers. Four of the data centers—Kent, WA; Wichita, KS; Philadelphia, PA; and Huntsville, AL—principally support Boeing operations at those locations. The fifth, located in Bellevue, WA, supports both Boeing and commercial customers, and the sixth, in Vienna, VA, serves the federal government. All centers and offices are linked by one of the largest privately owned telecommunications networks in the world.

### 5. Recent Events

To build on its success in the federal market and to increase federal business, Boeing has expanded its Vienna, VA headquarters and added 12 additional executive positions. While the additional building is being constructed, BCS has temporarily leased additional office space in nearby Reston, VA. BCS is currently pursuing two major SI contracts:

- HUD's Integrated Information Processing Services (HIIPS)
- The Department of State Telecommunications Network (DOSTN)

In a move to increase its penetration of the European market, BCS has signed a new distribution agreement with GEC, England's largest engineering and electronics company. The agreement covers BCS' Product and Process Document Management (PPDM) software. Tandem Computers is also a participant in the arrangement.

BCS also recently won a contract to maintain the Commonwealth of Pennsylvania's data communications network. The three-year contract was awarded through a recompetition of an earlier contract won by Boeing, which included the design and implementation of the multi-agency state network.

### 6. SI Organization and Staffing

Exhibit BCS-3 illustrates the Boeing organization. BCS is divided into two major groups: the Information Services group, which handles systems integration for external customers and is further divided into Government Business Development and Commercial Information Services; and the Boeing Support Group, which handles systems integration for the Boeing Company.

The Information Services group provides strategic systems development and integration products and services to government and commercial clients. The division also provides network integration and management products and services, document and image management products and services, remote computing services (including supercomputing), systems operations services, consulting services, packaged software products, and education and training services. Approximately 3,000 employees are active in this group, and further resources are drawn from the Boeing Support Group and other Boeing divisions.

Over 7,000 employees in the Boeing Support Group directly support the computing and telecommunications needs of the Boeing Company and its operating divisions. The Advanced Technology Center, which performs research in areas including artificial intelligence, software engineering, and high-speed processing, is part of the Boeing Support Group.

## **7. SI Business Objectives**

INPUT believes that BCS' strategic direction will be closely aligned with its areas of strength. Specific emphasis will be placed on opportunities requiring extensive systems and network integration, large computing facilities, and highly sophisticated, high-speed systems. The company will support these services by developing integration tools in areas such as network management and document/image management.

In shifting its attention from its traditional business areas, BCS has taken several steps:

- BCS has refocused its concentration from timesharing (a flat business) to systems integration, network integration, network management systems, document management systems, systems operations, and other areas of strategic importance to customers' businesses.
- BCS is emphasizing a value-added systems integration approach that also serves as an umbrella for its other products and services.
- BCS is focusing its software development efforts on value-added integration and management software that is not currently available in the marketplace—for example, the Product and Process Document Management (PPDM) software and the Integrated Network Management System (INMS) software.
- BCS is developing key alliances in product development and marketing with hardware vendors, telecommunications carriers, and consultants.
- BCS has instituted organizational changes to increase the visibility of the Information Services group within the company and to facilitate expansion into new markets.
- BCS has realigned its commercial systems integration activities to pursue and penetrate this growing market.

## **8. SI Capabilities Summary**

Boeing's capabilities lie primarily in systems and network management and integration, systems operations, project management, and computer services. As a systems integrator for the Boeing Company, BCS has designed and implemented the Boeing Telecommunications Management Center (TMC).



In late 1987, Boeing had five network control centers. Today, they are all consolidated in one centralized, real-time network management center. During 1989, the TMC monitored 17 complex networks, 13 major sites, 4,000 data circuits, 30 strategic switches, 110,000 switched lines, and 11,900 interconnect trunks. BCS is also completing a \$100 million modernization of Boeing's nationwide private voice network.

BCS' array of proprietary software products also increases its ability to capture SI work. For example, the Boeing Integrated Network Management System (INMS) caters to the varying technologies of many different vendors, so customers can use INMS with their existing baseline equipment as well as with new equipment. The Boeing Product and Process Document Management System (PPDM) can serve as a base for complex systems integration and management that includes large-scale image processing. Boeing's Contract Management Family includes proposal pricing, project management, estimating, scheduling and program history components, and also supplies the Executive Information Services (EIS) application development language tool. The company's line of scientific and engineering software also supplies customers with tools that enhance their system capabilities.

Boeing also remains active in traditional timesharing and supercomputer services. The company's MAINSTREAM Access services offer scientific and engineering customers a broad range of computing capabilities, including CRAY XMP/24 supercomputing processing, CDC CYBER and IBM systems processing, and gateway access service. These services are supplied through Boeing's data centers in Vienna, VA and Bellevue, WA. BCS also provides customers with facilities management services.

BCS strengths include requirements analysis and definition, systems architecture and design, facilities planning and management, network design and management, education and training, and project management.

## **9. SI Capabilities Evaluation**

BCS has extensive capabilities dispersed throughout its organization. A 1989 reorganization resulted in a staff dedicated solely to commercial systems integration opportunities. This indicates the company's serious intent to establish a strong presence in the commercial systems integration market.

### **a. Consulting/User Requirements Analysis**

BCS has strong technical and project management skills in consulting, particularly in the design and use of supercomputers, the design and management of large data center operations and networks, the management of documents, and the integration of manufacturing systems. The

company does not bill itself as a business or management consulting firm per se, but it does provide these services as part of a total systems integration assignment.

#### **b. Design/Integration**

BCS has excellent skills in the design and integration of complex systems, including centralized and decentralized information processing as well as telecommunications that serve a large number of geographically dispersed users. Boeing's base of computer and telecommunications equipment is quite diverse. In 1989 the company had approximately 84,000 computer workstations, 500 minicomputers, and 50 mainframes running on a multitude of local- and wide-area networks. The Boeing communications network is monitored through a central Telecommunications Management Center (TMC) that encompasses 17 complex networks and 13 major sites.

#### **c. Project Management**

BCS has developed a proprietary project management system that is comprehensive and is geared to large, complex projects. The Boeing Company's success in the commercial airplane business is due in large part to its skills in complex project management.

#### **d. IS Hardware**

BCS neither develops nor manufactures IS equipment. Over the years the company has worked with a multitude of vendors and has developed methods to objectively screen and select the best vendor for a particular job. Few organizations are able to work as successfully with large systems as BCS. BCS has developed extensive skills and expertise in implementing both mainframe-based systems and complex distributed networks.

#### **e. Communications Hardware**

While not a manufacturer of communications equipment, BCS has a solid base of knowledge in its application. The company has worked with a multitude of vendors and has developed methods to objectively screen and select the best vendor for a particular job. The company has developed and managed extensive networks both internally and for clients.

#### **f. Software Development**

BCS has a broad skill base and wide experience in software development. The company's present emphasis is on software that adds value to its systems and network integration work. Examples include the Inte-

grated Network Management System (INMS) and the Product and Process Document Management System (PPDM). The company also continues to market specialized engineering and scientific applications and contract management software.

#### **g. Application Software**

As noted in the previous section, BCS develops application software that adds value to its systems and network integration work.

#### **h. Systems Software**

BCS has a broad base of skills to develop systems software and has developed such software for use in its remote processing environment. It does not currently develop and market packaged systems software for use on client systems.

#### **i. Education, Training, Documentation**

BCS has strong skills in education and training, with a large organization dedicated to providing training services for Boeing staff and as a commercial offering. In addition to packaged courses, BCS will design courses to meet specific client needs.

#### **j. Service and Repair**

BCS provides service and repair to the corporation. As part of a systems integration and operations project, BCS will manage maintenance services for clients.

### **10. SI Strategic Alliances**

Several recent strategic alliances, summarized in Exhibit BCS-4, are indicative of BCS' short- and long-term focus.

## EXHIBIT BCS-4

**BCS Strategic Alliances**

Vendor	Purpose
Tandem Computers	Document management software
NEC	Integration Network Management Software (INMS)
IBM	SI partner
U.S. West	Network integration partner
Honeywell	High-speed circuitry and supercomputer development
Scientific Computer Systems	Operating systems software

- Through an alliance with Tandem Computers, Inc., BCS is developing a strategic document management product (Product and Process Document Management System—PPDM) that will run on the Tandem platform. Target markets include manufacturing and pharmaceuticals, as well as other vertical markets where Tandem or Boeing have strength, including transportation, finance, and utilities. The Boeing PPDM software will be marketed by the Tandem sales organization.
- A distribution agreement with GEC, the U.K.'s largest engineering and electronics company, for Boeing's PPDM software was recently signed. The contract is a three-way agreement between Boeing, Tandem Computers Inc., and GEC Computer Services, a division of GEC, which will have sublicensing rights to sell PPDM within its parent corporation. GEC will also have the right to sell the English language version of PPDM, either directly or through agents, to the European Economic Community.
- Through an alliance with NEC, network management software is being developed that provides interfaces to NEC's telecom products. Under the terms of the nonexclusive agreement, Boeing will retain all rights to its network management software. The software will be provided to NEC in addition to documentation, maintenance, and consulting support. NEC will combine the Boeing software with its own NEAX 2400-IMS PBX products under the name VISION Integrated Network Management System (VISION-NMS) and will market the product to corporations in the United States and Australia.

- BCS also has an alliance with IBM for joint bids on projects where BCS can add value in systems and network management and integration. IBM was a subcontractor to Boeing on a contract to design and implement a data communications network for New York City.
- BCS has a memorandum of understanding with US West Communications that formalizes a strategic alliance between the two firms to provide network integration services to medium- to large-sized business throughout the 14 states serviced by US West.
- An alliance with Honeywell will provide access to Very-High-Speed Integrated Circuit (VHSIC) technology for specialized applications.
- BCS has an agreement with Scientific Computer Systems to provide operating system software for the SCS-40 near-supercomputer.

## 11. SI Marketing Strategy

INPUT believes that BCS will place increased emphasis on integration projects that are of high value (over \$5 million) and that have a requirement for complex computing and network systems. This will enable it to leverage its strengths. BCS has significant strength in a number of areas that include systems and network design, and integration and management of large, complex projects. Systems integration will serve as an umbrella under which will be marketed value-added tools, products, and services such as the Integrated Network Management Software (INMS) and the Product and Process Document Management System (PPDM).

The company will round out its expertise in technology, project management, and systems/network management and integration by utilizing a wide range of development and marketing teaming and alliance partners, including computer/telecommunications hardware manufacturers, telecommunications manufacturers and carriers, and consultants.

Boeing will target vertical markets including manufacturing, utilities, transportation, pharmaceuticals, and federal, state and local governments, as well as other vertical market opportunities that are identified by alliance partners.

Exhibit BCS-5 summarizes BCS' approach.

EXHIBIT BCS-5

**BCS Marketing Strategy**

- Target industries
  - Federal
  - Manufacturing
  - Telecommunications
  - State and local government
  - Transportation
  - Pharmaceuticals
  - Others as identified by alliance partners
- Target cross-industry markets
  - Systems management and operations
  - Network management and integration
  - Document management/image processing
- Large project focus
- Focus on teaming and alliances

**12. SI Customer Base/Specific Projects**

During 1988, BCS was awarded the following contracts:

- In December 1988, it was announced that BCS and AT&T Federal Systems Division had won a ten-year federal telecommunications system (FTS 2000) contract for the General Services Administration (GSA) to upgrade the entire federal government telephone system to a digital voice, data, and video communication network. The new system will serve about 1.3 million federal government employees in about 3,500 locations throughout the U.S., Puerto Rico, and the U.S. Virgin Islands.
- BCS won a contract to design and implement a data communications network for New York City. The network will streamline and reduce the costs of the city's information services. BCS will install, test, and maintain the network, as well as provide network management training to users. IBM is a subcontractor to BCS on this project.
- In July 1988, BCS was awarded a five-year contract from the Department of Labor's Bureau of Labor Statistics to provide networking, remote computing services, technical support, and training.

- In June 1988, BCS was awarded a contract by the Internal Revenue Service to provide remote computing and technical support for several computer-based systems, including the Budget Preparation System and the Inventory Control and Distribution System, used to design, print, distribute, and stock all federal income tax forms.
- BCS, teamed with Booz-Allen & Hamilton, was selected to provide the U.S. Army Intelligence Agency with supercomputing architecture support. The BCS team will install additional computing equipment and networking, and will provide systems support. The team also will develop intelligence modeling tools and application software for the Army.

Other contracts include the following:

- Boeing implemented a \$38 million supercomputer network for the State of Alabama. In its first year of operation, the system achieved an 80% usage rate, with most customers coming from business and academia. This experience strengthened BCS' qualifications to bid on other SI projects that involve supercomputers.
- During 1987, BCS was selected to provide the Technical and Management Information System for NASA's space station program. This contract includes the design and implementation of an evolutionary engineering data base system that will operate with NASA Centers, contractors, and eventually other governments as the space station is developed and implemented. This program will add to BCS' list of strong technical credentials.
- Also during 1987, BCS was awarded an eight-year contract from the U.S. Army Forces Command to design and install a management information system for its headquarters operations at Fort McPherson near Atlanta, GA. BCS will integrate the new system with existing Army computer systems and provide local-area networks, 1,200 workstations, and training services.
- BCS has designed, installed, and is operating a nationwide telecommunications network for NASA. This integrated network provides voice, data, facsimile, and full-motion video capabilities.

### 13. Summary and Future Directions

BCS has various strengths and weaknesses, some of which are summarized in Exhibit BCS-6. It has shown particular expertise in those disciplines related to high technology and network management and integration, including:



- Systems design, integration, and management
- Network design, integration, and management
- Document management
- Image processing
- Artificial intelligence
- Supercomputing
- Facilities management and systems operation
- Program planning, management, and control
- Education and training

## EXHIBIT BCS-6

**BCS Summary****Capabilities**

- Extensive technical expertise
- Broad range of skills and resources
- Extensive project management expertise
- Strong teaming and alliance relationships
- Strong reputation in federal marketplace
- Ability to handle large projects

**Limitations**

- Federal/internal orientation reputation
- Limited commercial track record
- Limited business consulting capabilities

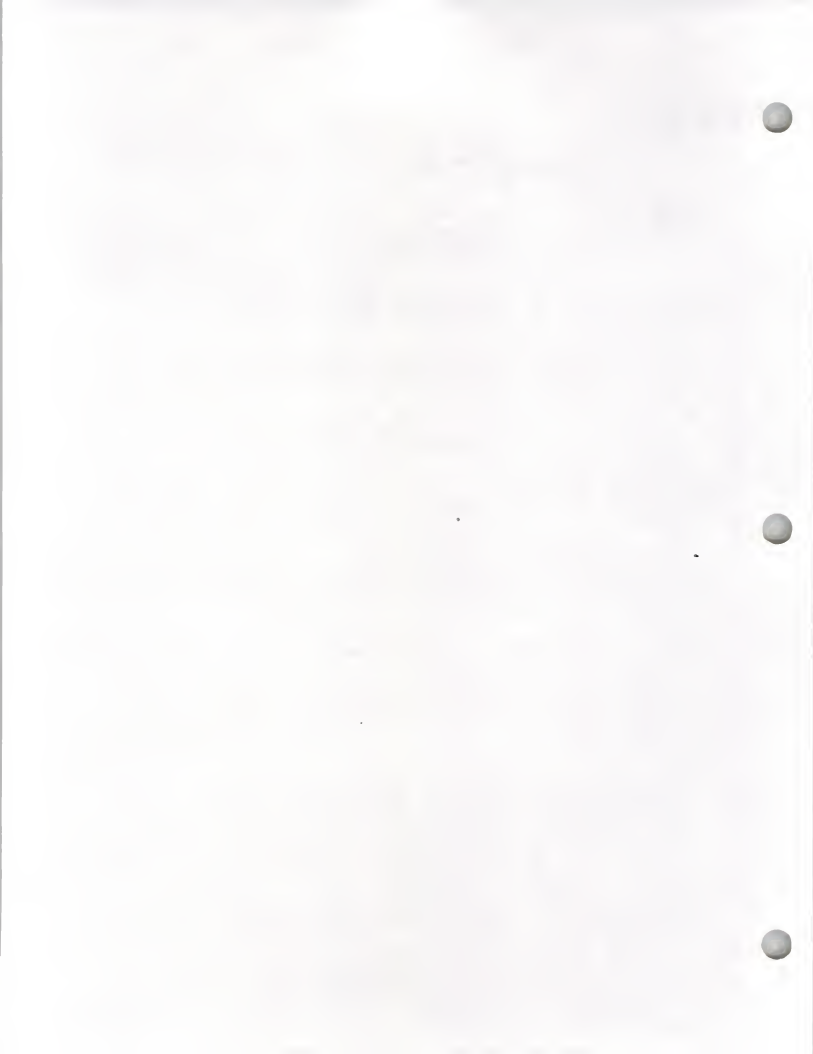
Generally, BCS has demonstrated excellent results in dealing with the government sector and has begun to achieve success with the private sector. The limitations it must overcome include:

- BCS does not currently have a strongly developed image in the private sector. It is frequently viewed as oriented primarily to government high-technology environments. BCS has, to some extent, struggled with its commercial business, as it has attempted to eliminate its federally- and internally-oriented image. It will need to continue to focus on convincing customers that it has a long-term commitment to the commercial information services business. Recent company reorganization has strengthened the visibility of commercial business within Boeing and BCS.
- While BCS has strong technical consulting skills in focused areas, it is limited in general business consulting capabilities.



- BCS, like other vendors with strong federal backgrounds, must focus on transforming its contracting, management, and pricing practices to meet the requirements of commercial customers. This is not an easy transition for a firm with a strong federal heritage.

INPUT believes that BCS will place its primary efforts on leveraging the technological and program management disciplines it has developed through implementing its federal government business and applying those skills in key vertical markets such as manufacturing and state and local government. BCS will be opportunistic in looking, often with alliance partners, for large contracts that utilize its systems and telecommunications development and management expertise.



## COMPANY PROFILE

Bull HN Information  
Systems, Inc.

### 1. Key SI Contacts

Ron Cuneo [Federal SI]  
President/Chief Executive Officer  
Technical Services Operation  
U.S. Marketing Sales and Services  
Bull HN Information Systems, Inc.  
Technology Park  
Billerica, Massachusetts 01821-4199

David Herter [Commercial SI]  
Vice President  
Technical Services Operation  
U.S. Marketing Sales and Services  
Bull HN Information Systems, Inc.  
Technology Park  
Billerica, Massachusetts 01821-4199

### 2. Description of Principal Business

Groupe Bull is a major European ADP equipment manufacturer, known worldwide as a vendor of information processing equipment and services. The U.S. Marketing Sales and Services organization, Bull HN Information Systems, Inc. (Bull) is the former Honeywell computer company. As Honeywell, Inc., it was well known for its computer and communications equipment and processing services, and for its professional/technical services. The current U.S. organization, although wholly owned by the French Groupe Bull, has been chartered with independent American management; thus, it can properly be included in restricted "buy American" procurements with Groupe Bull participating in its profits.

As an SI services vendor, Bull offers a complete range of products and services required to be a full-service SI vendor. Seeking primarily functional markets, coupled with selected industry targets, Bull's key offerings center on UNIX-based distributed processing systems and on-line transaction processing systems.

Bull (and before it, the original Honeywell corporation) has competed in the SI marketplace for more than 15 years. Like most of its competition, however, Bull did not address SI as a separate discipline and market until the market demanded it.

Current (1990) revenue for Groupe Bull's systems integration activities, exclusive of the Honeywell Federal Systems, Inc. revenue, is \$150 million. Its SI business currently is split evenly between mainframe-based system and distributed systems; its current SI contract values break out as shown in Exhibit BUL-1.

EXHIBIT BUL-1

**Distribution of SI Contract Values at Bull**

Component	Percent of Contract Value	
	Commercial	Federal
Equipment	50	60
Packaged Software	20	20
Professional Services	30	20

**3. Competitive Position**

Bull gains major advantage from being recognized as a worldwide provider of a full set of SI products and services. Bull has built a reputation as a provider of quality products and services contributing to customer satisfaction.

Clearly deciding to be a full-service SI services vendor, Bull offers all the requisite SI capabilities that INPUT has defined as the base set of SI capabilities. In addition, Bull uses alliances in nearly every area to strengthen both its capability and its responsiveness to its customers.

**4. Markets Served**

Bull's principal targets (70%) in the SI market are functional; it also pursues selected vertical market targets (30%), as shown in Exhibit BUL-2.

## EXHIBIT BUL-2

**Bull's SI Target Market Opportunities**

Vertical	Functional
Government (federal/state/local)	Networking
Retail and distribution	Multimedia
Financial services	Transaction processing
Manufacturing	Open systems—UNIX/OSF Workstations/work groups

**5. Recent Events**

Groupe Bull S.A. recently announced a massive international reorganization that includes stepped-up research and development efforts to unify the company's proprietary and UNIX platforms. The project, which had been targeted for completion in four years, is now on an accelerated schedule of two years, said Groupe Bull Chairman Francis Lorentz. Groupe Bull's R&D worldwide will be centrally budgeted and directed by Bull HN President and Chief Executive Roland Pampel.

Bull's recent introduction of its DPX/Prostation line of UNIX/486-based workstations is typical of the integration direction Groupe Bull is taking. DPX/Prostation is configured with the Bull Professional Environment (BPE), a complete desktop environment of applications and tools. Bull worked closely with the leading desktop operating system company, Santa Cruz Operation, and select applications developers—including Informix Software, Inc., Ingres Corp., and Frame Technologies—to create a fully functional system. "Bull intentionally went to these vendors because customers want popular third-party applications," said a company spokesman.

In January 1991, Bull HN Information Systems, Inc. was awarded a blanket contract by the Commonwealth of Massachusetts for the Superior Court, Department of the Trial Court of the Commonwealth, to provide computer systems to automate the Court's civil and criminal case management procedures.

In August 1990, Groupe Bull purchased Honeywell Federal Systems, Inc. (HFSI) from Honeywell, Inc. The HFSI operation, based in McLean, VA, has about 1,600 employees and did \$274 million worth of business during 1989. HFSI, now essentially a subsidiary of Groupe Bull, would be required by regulations governing foreign-owned companies to run the HFSI operation under a proxy arrangement, since the unit gets about 70% of its revenues from the Defense Department.

## 6. SI Organization

Bull's overall SI organization is headed by Ron Cuneo, President, Bull HN Information Systems. He is also responsible for the SI activities in the federal market. David Herter, Vice President of Technical Services Operations, heads Bull's commercial SI activities. The organization of Bull's SI activities is matrixed; this is to be expected in a major manufacturing organization like Bull. The division of SI responsibilities at Bull is summarized in Exhibit BUL-3.

EXHIBIT BUL-3

### Centralization/Decentralization of SI Business Functions at Bull

Responsibility	Commercial	Federal
Strategy and long-range planning	C	C
Marketing and promotion	C	C
Account management and sales	D	B
Contract review and approval	C	C
Project management and control	B	B
Implementation and development	B	B
Hardware and software acquisition	C	C
Systems operations	B	B

C=Centralized, D=Decentralized, B=Both

Bull's SI capabilities are primarily concentrated in the area of application systems development and implementation, as shown in Exhibit BUL-4.

Bull's SI staff ranges between 425 and 625, according to the distribution presented in Exhibit BUL-5.

## EXHIBIT BUL-4

**Distribution of Staff Capabilities  
to SI Activities—Bull**

Capability	Percent
Management, strategy and planning	5
Legal support/contract administration	3
Project management	7
Systems development/implementation	60
Hardware/software evaluation/acquisition	10
Hardware engineering	5
Sales	10

## EXHIBIT BUL-5

**Distribution of Bull's SI Employees**

SI Sector and Status	Number
Commercial SI—full-time employees	100-200
Commercial SI—additional employees	50
Federal SI—full-time employees	200-300
Federal SI—additional employees	75

**7. SI Business Objectives**

Bull's pursuit of SI projects is focused sharply on profits and responding to customer demand. A secondary objective is establishing a potential for follow-on facilities management contracts. Although not cited by Bull as motivating factors in its SI business, INPUT believes that Bull will use its SI business to maintain a satisfied customer base and leverage follow-on hardware and software sales opportunities.

## 8. SI Capabilities Evaluation

Bull offers the full range of SI services: consulting, design/integration, project management, hardware, communications products, system software, etc. In particular, Bull has strength in its on-line transaction processing and distributed information applications systems, as well as support for individual workstation and work group applications. Bull shows strength in nearly all areas, with additional strength gained from alliances, as shown in Exhibit BUL-6.

BUL-6

**Bull's SI Capabilities and Use of Alliances**

SI Capability	Strength	Alliance
Business consulting	Medium	Yes
Design methodology	High	Yes
Design/integration	High	Yes
Project management	High	Yes
Software development	High	Yes
Education/training/documentation	High	Yes
Packaged applications software	High	Yes
Packaged systems software	High	No
Standard computer hardware	High	Yes
Custom computer hardware	Medium	Yes
Communications hardware	Medium	Yes
Network management/operations	Low	Yes
Service and repair	High	No
Software maintenance	High	Yes

## 9. SI Strategic Alliances

As shown in Exhibit BUL-6, Bull uses alliances in nearly every area of its SI business. Bull uses both contract-by-contract and long-term alliances to support its SI activities under a formal alliances program. Bull's alliance partners, for example, range from British Telecom in the U.K. to Andersen Consulting in France, to Deloitte Touche in the U.S. In general, however, Bull's alliances support its SI business in the following ways:



- By broadening Bull's products and services offerings
- By satisfying customers' specific solution requirements
- By opening new markets in conjunction with "build versus buy" analyses

#### **10. SI Capabilities Summary**

Bull clearly offers a full range of SI products and services. Although Bull did not identify specific SI products or services that give Bull advantage over its competition, INPUT notes that Bull should gain advantage in several areas:

- A lean organization - The preponderance of staffing supports the delivery of SI products and services.
- Breadth of SI offering - Whether through in-house staff or alliance, Bull can deliver all the capabilities required for success in the SI marketplace.
- Breadth of alliances - Bull's alliances strengthen both the quality and responsiveness of Bull's SI capabilities.

Bull's wide range of services, supported by alliances, should make Bull able to support any required service needed, and demonstrate no apparent internal weaknesses in its SI offerings.

#### **11. SI Marketing Strategy**

Bull's dominant marketing strategy is to pursue functional targets. Stressing connectivity through open systems and promoting individual and work group productivity products, Bull concentrates on doing a few things very well. Bull's market targets, both vertical and functional, are summarized in Exhibit BUL-2.

Competitors - Bull's primary competition, in both commercial and federal SI markets, is summarized in Exhibit BUL-7.

## EXHIBIT BUL-7

**Bull's Primary Competition  
Commercial and Federal**

Commercial	Federal
Consulting firms	CSC
EDS	EDS
IBM	IBM
Regional software/ services vendors	McDonnell Douglas Unisys

- Positioning - Bull positions itself as a full-service SI services provider by offering all the required capabilities; it can perform any required service, whether in-house or through one or more of its alliances. Bull focuses on providing quality products and services while it maintains its solution orientation.
- Promotion - Bull uses all the forms of promotion identified by INPUT in its 1990 survey: public seminars, direct mail, advertising in general and trade/industry publications, television advertising, and client referrals—with varying levels of effectiveness. Bull finds advertising in trade/industry publications to be highly effective, along with word-of-mouth client referrals. Public seminars, television, and general business advertising are reported to be only moderately effective. Direct mail is relatively ineffective for Bull.

**12. SI Customer Base**

Groupe Bull has systems integration experience in Europe that it can leverage to advantage because of its stature as a worldwide equipment vendor. Typical of its broad experience are the projects listed in Exhibit BUL-8. They represent the range of technologies that Groupe Bull—as a full-service systems integrator—provides, and the range of clients and applications it is capable of addressing.

## EXHIBIT BUL-8

## Typical Groupe Bull SI Projects

Client	Project	Technologies
Ansaldo (Italy)	Complete plant automation	UNIX TCP/IP MRP II X.25 Multivendor equipment
Dept. Social Services (U.K.)	Largest operational European OSI network	DSA/OSI X.25 ICL GCOS 6
Post Office (France)	Workstation network for Financial Services Department	UNIX LAN X.25
Superior Court (MA)	Automation	UNIX Multi-vendor equipment

## 13. Summary

INPUT identifies Bull as a vigorous competitor in the SI marketplace, since it has chosen to be a full-service SI vendor by developing all the required SI capabilities either in-house or through alliances. It is apparent in its wide array of alliances that in promoting quality and responsiveness, Bull intends to grow with the SI market.

Groupe Bull is well positioned to be a worldwide systems integrator serving the needs of its global clients. The recent acquisition of Honeywell Federal Systems, Inc. enhances that capability still further. The emphasis on systems integration is in line with the overall company strategy of expanding its role from that of an equipment vendor to that of a full-service provider in the information technology industry.

The systems integration orientation will strengthen Group Bull's image as a problem solver and business partner among clients and prospects. The move into systems integration is viewed as positive internally, since the systems integration market is a clearly defined, maturing market that has been profitable for the vendor community.



## COMPANY PROFILE

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### Computer Sciences Corporation

#### 1. Key SI Contacts:

##### Federal Systems Integration

Mr. A. E. Nashman  
Group President, Systems Group  
3160 Fairview Park Road  
Falls Church, Virginia 22042

##### Commercial Systems Integration

Mr. Paul J. Crowley  
President, CSC Consulting  
5 Cambridge Center  
Cambridge, Mass. 02142

Mr. James A. Champy  
Senior Vice President, Consulting Group  
Cambridge, Mass.

Mr. John M. Thompson  
Chairman, CSC European Operations

##### Corporate (Federal or Commercial)

Mr. Mel Bergstein  
Senior Vice President, Systems Integration  
5 Cambridge Center  
Cambridge, Mass. 02142

#### 2. Description of Principal Business

Computer Sciences Corporation is a nearly pure computer services organization. It manufactures minimal amounts of equipment, primarily specialized communications interfaces in low volume. It promotes itself as a leading systems integrator and software developer. The company also provides specialized proprietary services to markets such as finance, healthcare, claims processing, network management and income tax processing. CSC also provides remote computing services to private industry and government.

Exhibit CSC-1 includes CSC's revenues for fiscal year 1990, which ended March 31, 1990. As can be seen, the majority of revenues (65%) was from the systems group, which provides systems and services to the federal government.

## EXHIBIT CSC-1

**Fiscal Year 1990\* Revenues by  
Business Segment**

Business Segment	Revenues (\$M)	Percent
Systems Group	966.2	65
CSC Consulting	276.0	18
Industry services	258.2	17
Total	1,500.4	100

\* Fiscal Year Mar. 31, 1989 - Mar. 31, 1990

In addition to sustained growth in this traditional business area, CSC is making a major thrust to expand its business into the commercial market through its consulting and industry services groups, which represented 35% of its fiscal year 1990 business. These services include consulting and systems development and integration services for commercial, financial, industrial and international clients. Also included are consumer credit, health and insurance processing services, and a segment which provides income tax processing services.

### 3. CSC Competitive Position

CSC has been very successful with its federal systems and services and professional services businesses, where it has provided requirements analysis, software development, systems engineering and integration, and communications and facilities management, primarily to its major customer, the U.S. federal government. The company has historically had a very high success rate, winning over 60% of bids, although in calendar year 1989, its win rate declined to 57%. It also has a strong base of multiyear mega-contracts, generally contracts with a total value in excess of \$100 million, which fuel the company's traditionally strong growth rates. CSC reports that in fiscal 1989 it won eight such awards with total contract values in excess of \$1.7 billion, in addition to scores of smaller contracts. In fiscal 1990 it did not have its customary success in winning these large "mega-contracts."

CSC had not played a major role in the commercial professional services market before 1987, when it announced a goal of attaining 50% of its profits from commercial business by 1992, based on increasing its

commercial revenues to 40% of the total. The company also announced at that time that it had \$200 million to spend on acquisitions to augment its existing commercial business. It has made several significant acquisitions to implement this strategy, including Computer Partners, Index Group, CIG-Intersys and others, which will be described in Section 5.

In January 1989, it sold a majority interest in Infonet, its worldwide public network subsidiary, to a group of European and Pacific telecommunications administrations to strengthen Infonet's position as an international communications service. In 1990, it sold its remaining Infonet interest to MCI. CSC had an extremely successful fiscal 1990, with revenues growing 15%, 22% from continuing operations, and net earnings 15%. Its federal revenues grew significantly (11%), despite a fiscally constrained federal market. The nonfederal segments of CSC's revenues grew from 29% to 34% of total revenues, as can be seen in Exhibit CSC-2.

EXHIBIT CSC-2

**CSC Fiscal Year Revenues  
by Major Market**

Market Segment	Percent of Total Revenues	
	1989	1990
Federal government	71	66
Commercial	20	21
State and local government	3	3
International	6	10

INPUT believes that a cornerstone of CSC's commercial thrust will be systems integration. It will combine its federal systems integration experience with the consulting and vertical marketing expertise gained through its existing commercial processing services businesses and acquisitions. It can also be expected that CSC will continue to look for acquisition candidates to broaden its commercial capability and geographic coverage.

CSC indicated that its calendar year 1989 systems integration revenues were \$400 million, distributed as shown in Exhibit CSC-3.

EXHIBIT CSC-3

**CSC Systems Integration Revenues  
1988**

Business Component	\$ Millions
Federal	325
Commercial	75

#### 4. Markets Served

CSC has expertise in tax, credit, health and insurance processing through its processing services offerings. CSC Partners (formerly Computer Partners) provides vertical market expertise primarily in manufacturing, distribution, finance, insurance, retail, publishing, utilities and state and local government. Cleveland Consulting adds depth in consulting in logistics and operations management. CIG-Intersys provides European experience in retail banking as well as in the other vertical industry markets in which CSC claims strength. The company is leveraging this experience by focusing its systems integration activities on the vertical industries identified in Exhibit CSC-4.

Exhibit CSC-4 also identifies specific functional markets that CSC is pursuing. Its focus on these markets is a result of its technology expertise, gained from participating in many large federal programs.



## EXHIBIT CSC-4

## SI Market Focus—CSC

Vertical Industry	Functional
Federal government	Networking
State and local government	Office automation
Distribution	Digital image handling
Retail	Facilities management
Finance	Logistics
Insurance	
Telecommunications providers	
Publishing	
Manufacturing	

### 5. Recent Events

In July 1986, CSC acquired Computer Partners (revenues of approximately \$15 million), a professional services firm with offices in the northeast corridor. Computer Partners, now known as CSC Partners, has vertical market expertise in manufacturing, distribution, finance, insurance, utilities, and state and local government.

In October 1988, CSC acquired Index Group, Inc. (\$30 million in annual revenues), a leading consulting firm to major U.S. and European companies specializing in the strategic use and management of information technology. This acquisition added a strong senior commercial consulting capability to CSC's strong systems integration credentials.

In April 1989, CSC announced that it would acquire CIG-Intersys, the largest computer services organization in Belgium (1988 revenues of approximately \$85 million). CIG also operates in France and the Netherlands, and holds minority ownerships of firms in Argentina and West

Germany. It provides consulting, computer systems and network integration, software engineering, software products, and data processing services. CSC already had European operations in the United Kingdom, Germany, the Netherlands and Belgium. This acquisition strengthens its European market position as well as adding specific European vertical market knowledge.

In May 1989, CSC created a separate commercial and international group, called the Consulting Group, which brought together under one organization: CSC Partners, focused on commercial systems development and integration; Index Group, which works with clients on information technology strategies; European operations, including CIG-Intersys; and Communications Industry Services, a software development organization for telephone company needs. This Group was managed by Thomas Gerrity, former Chairman of the Index Group, and was focused on providing commercial and international customers with a full range of information services. This move focused these organizations, which had reported independently to the Chairman, under a single management and on the commercial and international professional services market.

In mid-July 1989, CSC announced that Mel Bergstein, a former senior partner of Andersen Consulting and a well-known and respected industry figure, had joined CSC as a senior executive in the Consulting Group. While with Andersen Consulting, Mr. Bergstein was instrumental in the technical development of development methodologies and products, including FOUNDATION and MACPAC. He was also responsible for the development of a strong sales organization. His reputation and knowledge will assist CSC in future acquisitions, product development, refocusing federal skills and methodologies to commercial markets, and in the overall marketing and sale of CSC's evolving capabilities. This event emphasizes again how serious CSC was and is about penetrating commercial systems integration. In May, 1990 Mr. Bergstein was given corporate responsibility for systems integration reporting directly to Mr. Hoover.

In November 1989, CSC made three additional acquisitions to enhance its commercial capabilities. They were: Cleveland Consulting, LPS Inc., and Inforem Limited.

Cleveland Consulting counsels clients on strategies and effective management of all of the linkages in their supply chain. The activities involved are buying materials and making, moving, and selling products. This Cleveland, Ohio-based firm was purchased from Saatchi and Saatchi when it decided to disband its consulting business.

LPS, Inc. was a privately held professional services firm, based in Minneapolis, which added 140 employees and annual revenues of \$9 million in an area where CSC had limited geographic coverage.

## EXHIBIT CSC-5

**Major Recent Developments**

- Acquisition of Computer Partners and Index Group
- Acquisition of CIG-Intersys
- Consolidation of commercial professional services
- Key executive appointments

Inforem Limited, based in metropolitan London, provides information technology and consulting, and has developed integrated systems for clients in the financial services, retail and leisure industries. It has annual revenues of about \$20 million.

In the first quarter of 1990, CSC acquired Dallas-based LOGIC Inc, a closely held firm providing financial insurance software and services. LOGIC's software systems administer life and disability insurance for credit loans and mortgages insurance for warranty and mechanical breakdown and collateral protection insurance.

In the first quarter of 1990, CSC also signed an alliance with Digital Equipment Corporation to pursue systems integration business in the distribution and logistics marketplace, as well as integration opportunities within the telecommunications industry.

**6. CSC Organization**

The CSC organizations that are involved in systems integration are highlighted in Exhibit CSC-6.

SI resources are distributed across three major organizations consisting of a number of divisions and companies. Federal systems integration activities are the responsibility of Alvin Nashman, Group President, Systems Group. Commercial systems integration activities are now the responsibility of Paul Crowley, President of CSC Consulting, and are carried out in CSC Partners, Index Group, Communications Services and Cleveland Consulting. The third organization, headed by John Thompson, has responsibility for developing CSC's European presence. Mel Bergstein, Corporate Vice President of Systems Integration, provides staff focus and guidance for systems integration, pursues corporate-to-corporate alliances, and has responsibility for large account development.

## EXHIBIT CSC-6

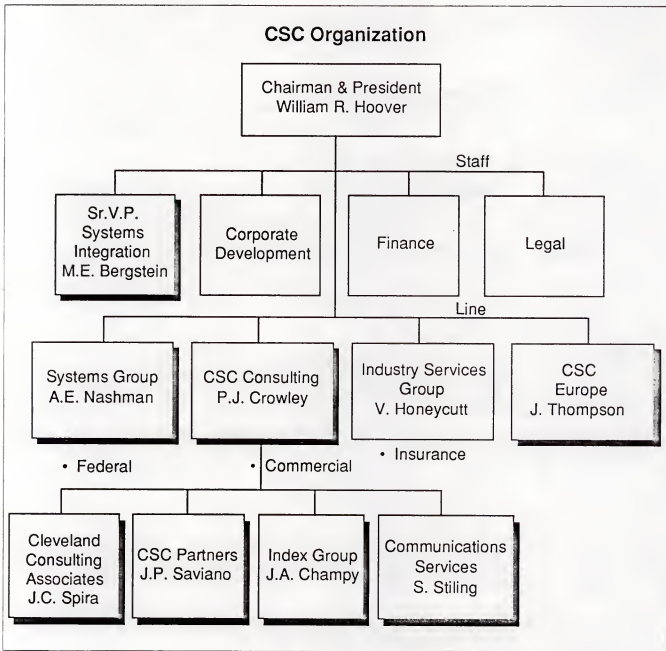


Exhibit CSC-7 is an estimate of how the SI personnel are distributed among functional activities. There is a strong professional services content, with 85% of the resources allocated to project management, systems development and implementation, hardware and software evaluation, and acquisition and hardware engineering.

EXHIBIT CSC-7

CSC Distribution of SI Personnel	
Capability	Percent
Management, strategy & planning	5
Legal support/contract administration	5
Project management	15
System development/implementation	50
Hardware/software evaluation/acquisition	15
Hardware engineering	5
Sales	5

CSC has a similar organization philosophy for both federal and commercial SI activities. As indicated in Exhibit CSC-8, most implementation activities are decentralized, though marketing and promotion are done centrally. Strategy and long-range planning are a joint activity with both line and headquarters participation. Account management and sales are performed centrally for federal SI and are both centralized and decentralized for commercial SI.

## EXHIBIT CSC-8

**Centralization/Decentralization of SI Business Functions**

Responsibilities	Commercial	Federal
Strategy and long-range planning	B	B
Marketing and promotion	C	C
Contract review/approval	B	C
Account management/sales	D	D
Project management/control	D	D
Implementation/development	D	D
Hardware/software acquisition	D	D
Systems operations	D	D

(C=Centralized, D=Decentralized, B=Both)

**7. SI Business Objectives**

CSC is clearly focused on systems integration as a means of changing its revenue and profit mix. As mentioned earlier, CSC's primary objectives for SI are revenue and profit growth, particularly in commercial SI. Commercial SI expansion will be driven by corporate business objectives that include 40% of revenues and 50% of profits being derived from the commercial business. CSC recognizes that industry is looking for business and information consulting and business solutions, and has established a primary objective of responding to these customer demands. Secondary SI objectives are control and expansion of its account base, and developing a follow-on facilities management business. CSC, through a task force headed by Mr. Bergstein, is currently examining increased participation in the systems operations market. The company's objectives do not include significant, if any, hardware or software sales.

## 8. Internal SI Capabilities Evaluation

CSC's experience, its strong set of technical skills, and its success in federal systems integration positions it well to participate in the commercial SI market. In addition, through acquisition and its processing services activities, it has a base of commercial skills. Brief descriptions of the individual SI capabilities are given below:

- a. Business Consulting—These skills, once limited to federal applications, have been expanded to the commercial market through the acquisition of a premier consulting organization, Index Group. The acquisitions of Computer Partners, Cleveland Consulting, CIG-Intersys and other firms also strengthen this area.
- b. Design Methodology—CSC has been known traditionally as a competent and capable designer of information solutions. It has and uses CASE products to support its design methodology.
- c. Design and Integration, Project Management, Software Development, and Education, Training and Documentation—CSC has been strong in these areas and should be able to transfer these capabilities to commercial opportunities effectively.
- d. Packaged Application Software—CSC's primary application software offerings are provided through its Industry Services Group. It had marketed a turnkey system called MAN-FACT II to discrete manufacturers, but sold it in March 1989. CSC also has developed industry-specific software for insurance and tax processing. Its purchase of Logic Inc. strengthens its insurance offerings.
- e. Packaged Systems Software, Standard Computer Hardware and Custom Computer Hardware—Computer Sciences manufactures no computer hardware, nor does it develop systems software products. It prefers the flexibility of being able to select the products that are best suited to meet the needs of the current systems problem and that will provide the best solution.
- f. Network Management and Operations—CSC has strong network management and operations capability as a result of experience developed through its remote processing businesses, its worldwide Infontet network, and the building of private data networks for the U.S. government. It has participated successfully in large federal network contracts such as the U.S. Treasury and FTS-2000. It is interesting to note that it often works closely with AT&T; announcement of a formal relationship with AT&T has been rumored in the past.

- g. **Service and Repair**—CSC offers system service and repair only as part of its remote processing and network services, or ancillary to its systems integration contracts.
- h. **Software Maintenance**—Since CSC provides limited software products, it has limited software package maintenance capability.

## 9. SI Strategic Alliances

CSC has historically not made a conscious effort to publicize a broad set of alliances. It believes that development of these alliances would cast doubt on its ability to be truly independent in developing the best solutions for its customers. In its federal SI efforts, CSC has worked with most of the major hardware and software vendors in teaming or prime contractor/subcontractor relationships. The company feels comfortable that it can develop and work whatever relationships are necessary to meet its prime contractor responsibilities.

During late 1989, CSC did begin to announce formal alliances, the first with SP America to market vertical industry solutions, primarily in manufacturing and distribution-related industry segments. In early 1990 it announced an alliance with Digital Equipment to pursue SI opportunities in distribution, logistics and telecommunications.

Among its many relationships, of particular note are those with AT&T and IBM. AT&T is a major CSC customer and CSC has developed a number of projects for and with AT&T, including the major U.S. government communications contract, FTS-2000. CSC has worked with IBM on a variety of programs, the largest being the \$3.5 billion FAA award.

Overseas, CSC announced last year a five-year joint marketing agreement with British Telecom.

## 10. SI Capabilities Summary

Exhibit CSC-9 identifies CSC's major strengths and weaknesses. As a candidate in the commercial SI arena, it has strong experience and technical capabilities. It has a reputation in the federal market as an aggressive competitor and competent integrator. It has broad and strong technical and management skills. It is not committed to a single vendor's hardware and/or software products and, as a result of its recent acquisitions, now has commercial strategic consulting skills and enhanced vertical industry knowledge and experience.



## EXHIBIT CSC-9

**CSC Competitive Status**

Strengths	Weaknesses
Federal SI experience	Geographic coverage
Technical strength	Commercial sales organization and experience
Product vendor independence	
Business consulting skills	

CSC's major weaknesses in the commercial market are its lack of commercial marketing experience and geographic sales and implementation coverage.

**11. SI Marketing Strategy**

CSC's commercial systems integration strategy is now focused in CSC Consulting and CSC Europe, as indicated in exhibit CSC-10.

## EXHIBIT CSC-10

**CSC SI Marketing Strategy**

- Focus commercial growth on CSC Consulting and CSC Europe
- Focus on strategic consulting, then implementation
- Leverage federal experience
- Build on Partners' and CIG-Intersys' commercial experience

The marketing strategy appears to be built on leveraging the Index Group's strategic consulting reputation and programs. The Index Group has provided high-level education and consulting to both U.S. and European clients. It has a reputation for providing excellent client support in identifying strategic information systems requirements, developing strategic solutions that provide competitive advantage, and addressing mission-critical applications. This capability that Index Group provides is critical to CSC's marketing strategy, as it does not otherwise have access to a large commercial customer base or a large commercial sales force.

From an implementation point of view, CSC's credentials are extremely strong, as it has its federal skill base, CSC Partners, CIG-Intersys and its other acquisitions to call on. As other federal integrators have recognized, CSC will have to train its people to interact effectively with commercial customers, and to modify its federal implementation practices to work effectively in a commercial environment. CSC has, and continues to carefully select, acquisitions and partners to assist in this transition.

## 12. SI Customer Base

A number of the projects that CSC has won and is implementing are listed in Exhibit CSC-11. They are:

- Dade County Airport—As prime contractor, CSC has been responsible for the automated cargo information system for the airport and seaport of Miami, Florida. Responsibilities include design, implementation, integration, and facility management of the system, including software, communications equipment, and user procedures. The system connects 20 airlines, 15 brokers/forwarders, and the required federal agencies.
- U.S. Air Force—As prime contractor, CSC is providing systems integration services for the Air Force's new Stock Control and Distribution system. CSC's deliverables include the teleprocessing to support transportation and depot processing, retail and maintenance operations, inventory control points, and depot management.
- Cincinnati Gas and Electric—CSC is participating in all phases of the development of a new on-line customer service system that includes subsystems for order entry and tracking, billing, and financial records processing.
- AT&T—CSC maintains, enhances, and develops the circuit provisioning system used nationwide by AT&T to issue and track service orders, maintain an inventory of equipment and facilities, and design long-distance circuits.

- U.S. Treasury Department—CSC is the prime contractor for the design, integration, implementation, and operation and maintenance of the Consolidated Data Network which meets the needs of the various departments of the Treasury. At this date, the major user is the U.S. Customs Service, with the IRS just beginning to phase in. The packet-switched network has 21 backbone nodes, and by the mid-1990s will serve 7,500 locations worldwide and over 65,000 terminals.
- Kennedy Space Center—CSC is the prime contractor responsible for NASA/KSC's office automation system. This system supports all secretarial, professional, and management staffing at KSC.
- Weirton Steel—This five-year project, called IMIS (Integrated Manufacturing Information System), is focused on providing superior customer service through improved inventory control and scheduling and other state-of-the-art manufacturing techniques.

## EXHIBIT CSC-11

**Examples of CSC's Customers & Contracts**

Company/Industry	Project Description
Dade County Airport	Automated Cargo Information System
U.S. Air Force	Stock Control and Distribution
Cincinnati Gas and Electric	Customer Services System
AT&T	Trunk Inventory and Control System
U.S. Treasury Department	Consolidated Data Network
Kennedy Space Center	Office Automation System
Weirton Steel	Manufacturing Information System
Massachusetts Water Resources Authority	Capital Projects Information System

- Massachusetts Water Resources Authority—This project involves the implementation of a major information system to monitor and control the progress of the large capital projects that the Authority will be implementing over the next several years to improve water and sewer systems in 60 communities.

### 13. Summary and Future Directions

It is clear that CSC has set its sights on becoming a major player in commercial systems integration, and is making significant investments to reach this goal. It has carefully selected and acquired firms that will help it achieve this goal. INPUT believes CSC's strategy, which is built around strategic consulting provided by the Index Group and its solid federal project management skills, is sound. It provides unique commercial consulting experience as well as access to a commercial client base—both capabilities that federal integrators generally lack.

Its string of carefully selected acquisitions provide it with the bridge that is necessary to convert federal experience and skills to commercial application implementation. However, CSC may not yet realize quite how difficult this step is.

INPUT believes that CSC will continue to acquire commercial firms that expand its geographic and vertical industry coverage. On the whole, CSC's strategy seems sound.

## COMPANY PROFILE

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### Computer Task Group (CTG)

#### 1. Key SI Contacts

Mr. David N. Campbell  
Chairman & CEO  
800 Delaware Avenue  
Buffalo, NY 14209

Mr. Jack Courtney  
President  
800 Delaware Avenue  
Buffalo, NY 14209

Mr. Vince Lamb  
President  
Scientific Systems Services (SSS)  
475 South John Rodes Blvd.  
Melbourne, FL 32904

#### 2. Description of Principal Business

Computer Task Group (CTG) is a leading provider of computer-related professional services to the commercial marketplace. CTG designs, builds, implements, and in some cases maintains information systems. The company's services consist of consulting, systems analysis, systems design, systems integration, and programming. Areas of special expertise include; business systems programming, engineering, scientific, process control, and automated software conversions.

CTG makes extensive use of software automation in its professional services contracts. The scope of professional services work performed by CTG ranges from specific, minor tasks of short duration, to large complex tasks that require larger numbers of systems engineers for extended time periods. Typically, CTG's professional staff augments and becomes part of the client's on-site software development team on a specific application or project. However, in recent years CTG has established approximately 20 Software Development Centers to support off-site development and implementation in support of client projects.

In 1988 CTG will report total revenues of \$218 million, an increase of approximately 28% over the \$170 million reported for 1987. This follows a 19% increase of \$27 million in 1987. Overall, CTG has shown double-digit growth rates since the early 1980s, with only occasional downturns in profit.

Much of CTG's growth in revenue and geographic coverage can be attributed to acquisitions. There have been at least 14 since 1985. Acquisitions candidates are selected to augment specific skill areas and to gain geographic coverage. The purchase of Scientific Integrated Systems Services for approximately \$11 million in January of 1988 was significant in boosting CTG's presence in the systems integration market. The subsidiary, renamed Scientific Systems Services (SSS), specializes in integrated computer systems for manufacturing.

CTG serves both the vertical and cross-industry markets. A summary of its primary focus is contained in Exhibit CTG-1.

EXHIBIT CTG-1

### CTG's Primary Market Targets

Cross-Industry Markets	Vertical Markets
Business Applications Programs	Banking (All Aspects)
Systems Analysis and Design	Brokerage/Insurance
Process Control	Manufacturing
Software Conversion Services	Telecommunications
Packaged Software Support	Public Utilities

### 3. Company Competitive Position

CTG is one of the largest providers of professional services to the commercial market in the U.S. Its primary strategy has been to be a customer's single source for systems design and programming support, made possible by a staff of over 2,600 systems engineers.

CTG's internally developed software design and development tools enable it to compete against larger firms for SI projects. CTG is a recognized leader in the systems conversion business and has very strong abilities in the DOS-to-MVS conversion market.

CTG targets its services primarily to large manufacturing, industrial automation, financial services, and telecommunications firms with large data processing operations. CTG clients include over 75 of the Fortune 100 companies, and over 80% of the firm's new professional services contracts come from the existing client base. Over 30 of CTG's clients have billings in excess of \$1 million with CTG.

CTG will post systems integration revenues for 1988 in excess of \$35 million dollars, approximately 16% of the total revenue stream. This represents a seven-fold increase over reported SI revenues of approximately \$5 million in 1987. While not in a league with today's major players, this represents a significant revenue stream for a company that only entered the business three years ago. The revenues have been generated on about 15 commercial projects with an average size in excess of \$2 million, and CTG anticipates its participation in the market to grow at a rate in excess of 35%.

#### 4. Markets Served

As indicated in Exhibit CTG-1, CTG's general professional services business participates in virtually all significant vertical, and a significant number of cross-industry markets. The current targets for systems integration are somewhat more limited. CTG is focusing on:

- Process manufacturing automation
- Materials handling (cross-industry)
- Communications
- Manufacturing/robotics

CTG's focus in these areas is stimulated by its belief, in addition to being growing market segments for SI, that these areas will permit them to leverage off of its established client base. Although not specifically mentioned by CTG, INPUT believes that these areas are well suited to the strengths of its recently acquired subsidiary, Scientific Systems Services (SSS).

#### 5. Recent Events of Interest

As mentioned previously, CTG has been growing substantially through acquisition. In addition to Scientific Systems Services, CTG has made several other acquisitions since 1986 that will strengthen its position in systems integration.

- CTG acquired Telecommunications Management Corporation in late 1988. This organization has particular expertise in voice networks and network management.

- A significant investment was made in Analysts International, Inc. in January of 1987. CTG claims that the deal was primarily for investment purposes.
- Maxima Computer Management Consultants, Inc. was purchased in October 1986, and should give CTG access to the federal government, banks, and additional manufacturers.
- Creative Computing was acquired in August 1986 and should help strengthen CTG's data base and data communications expertise.

Another event that has some importance was the dramatic decrease in profitability which occurred between 1986 and 1987. CTG management states that much of the slowdown is attributed to high levels of non-billable time of the professional staff in foreign operations. CTG also cited an investment of \$400,000 in new branch operations in the U.K. as a reason for lower profits.

It appears however, that there has been a significant recovery in 1988 that should allay any fears that there is a fundamental flaw in CTG's market or delivery strategy.

## 6. SI Organization

CTG operates with a lean corporate and administrative staff with only slightly over 400 of the total staff of approximately 4,000 employees listed as "non-professional." Headquarters provides forecasting, strategy development, and financial management while leaving much of the other administrative responsibility to local branches, which are linked to headquarters via a PC/mainframe information network. CTG currently has over 70 offices.

CTG's Institute for Technical and Management Training in Buffalo provides in-depth training for CTG staff. Thirty technical and 20 marketing and management courses are offered. In addition, all new employees get a six-week course on CTG's Systems Engineering Development Programs. INPUT estimates that over 1,500 employees attend these classes on an annual basis.

The delivery of systems integration services is focused primarily in Scientific Systems Services (SSS) which CTG operates as a subsidiary reporting to Jack Courtney, President of CTG. The revenue of this organization is close to 100% SI. Additional SI work is done by other matrixed units of CTG, such as the Corporate Projects Office (CPO) and other specialty business groups. In general the responsibilities are divided as indicated in Exhibit CTG-2. The only totally centralized function is SI contract approval.



## EXHIBIT CTG-2

**Centralization/Decentralization  
of SI Business Function  
Computer Task Group**

Responsibilities	Commercial	Federal
Strategy and long-range planning	B	N/A
Marketing and promotion	B	N/A
Account management/ sales	D	N/A
Contract review/approval	C	N/A
Project management/ control	B	N/A
Implementation/development	D	N/A
Hardware/software acquisition	D	N/A
Systems operations (if applicable)	D	N/A

C = Centralized, D = Decentralized, B = Both

CTG currently has a full-time commercial SI staff of approximately 250. In addition, it estimates that at any given time there are at least 50 other professionals assigned to SI projects. The breakdown of staff between various skill requirements is typical of systems integration vendors whose primary business has been professional services. This is summarized in Exhibit CTG-3.

## EXHIBIT CTG-3

**Distribution of SI Personnel  
Computer Task Group**

Capability	Percent
Management, strategy, planning, marketing	5
Legal/contract administration, finance	2
Project management and administration	5
Design/development/implementation	70
Hardware/software evaluation/acquisition	10
Hardware engineering	3
Sales	5

**7. SI Business Objectives**

CTG has maintained a consistent strategy of being the customer's single source for design and programming support. This strategy has led the company to the development of broader professional services capabilities, and moved CTG into the position of a "full-service" provider. As a full-service provider and rapidly emerging player in the SI marketplace, CTG has adopted two primary objectives:

- Derive revenue and increased profit margins from the special capabilities provided as a systems integrator
- Respond to existing customer demands for buying complete solutions

CTG recognizes that the key to increasing profit margins is through specialization. By specializing CTG is able to command premium rates for its staff. In essence, systems integration is one of the several professional services specialty areas through which CTG hopes to achieve its profit objectives.

## 8. SI Capabilities Evaluation

CTG's primary strength lies in its professional services capabilities. Over 80% of its staff is college educated, and almost all of the systems engineering staff have skills in data base and communications technologies. By its own evaluation CTG ranks high in business consulting, design integration, project management, and software development. The following presents INPUT's assessment.

- Business Consulting - While not at the level of some of the competition in a broad range of industries, this is a strength for CTG, particularly in manufacturing-related projects.
- Design Methodology/Design Integration - Although CTG does not have a packaged methodology, it has made extensive use of automation to support the design and development process. This is a significant strength.
- Project Management - Again, CTG has utilized technology and training of personnel to develop an effective capability. While the approach is effective, it has not been applied to many very large projects. Given the aggressive approach to the market, this capability will undoubtedly be put to the test in the very near future.
- Software Development - CTG is state of the art in this area. Its use of advanced CASE tools and software development aids may be the best in the industry, and it appears to be making the educational and developmental efforts necessary to maintain that leadership position.
- Education, Training, and Documentation - CTG possesses these capabilities in house and by INPUT's estimate probably is above average in capability. The company's use of automated software development tools should significantly contribute in the documentation area.
- Packaged Applications and Systems Software - CTG offers no packaged applications software to INPUT's knowledge. There are a few vertical markets where the company has experience in this area. Also, SSS undoubtedly brings some products and capabilities from its niche market. However, INPUT believes that this is an area where CTG could use significant strengthening. In the area of systems software, CTG has many important alliances.
- Standard Computer Hardware - CTG has extensive working experience with virtually all lines of IBM and DEC hardware. Other environments with which it has experience include: Honeywell, CDC Cyber, Prime, Data General, Harris, and Hewlett-Packard. In this area it has a strong portfolio to offer.

- **Communications Hardware** - As in the case of computer hardware, CTG relies primarily on alliances and partners in the area of communications. It is INPUT's position that the company does not have the strengths or experience in communications that it has assembled in the computer hardware area.
- **Network Management and Operations** - Over the past 18 months CTG has been building an internal data communications group to bolster its capabilities in this area. In addition, the acquisition of Telecommunications Management, Inc. in December 1988 will supplement the growing capability in data with voice expertise.
- **Service & Repair, Software Maintenance** - CTG has virtually no capability in the area of hardware service and repair and relies on alliances in that area when necessary. Obviously the company does provide software maintenance, although this is not a major marketing attribute for it in systems integration.

## 9. SI Strategic Alliances

CTG recognizes the need to utilize alliances to provide the total solution to the customer and to bolster its general capabilities. It utilizes both long-term agreements and contract-by-contract arrangements to accomplish these objectives. CTG's alliances tend to break down as follows:

- **Technology-based alliances** tend to be long-term in nature. They result from the need to remain state of the art in the application of particular technology that can be utilized in many client situations.
- **Solution-specific alliances** tend to be formed on a contract-by-contract basis where the need of a client is unique, and there appears to be no applicability of the need to a larger target market.

The majority of CTG's alliances have been formed with hardware and systems software vendors. The primary hardware alliances are with DEC and IBM; while other vendor alliances provide capabilities in 4GL, expert systems, and relational data base management systems. Noticeably absent are longer term arrangements with communications or applications software suppliers.

A summary of CTG's alliances is contained in Exhibit CTG-4.

## EXHIBIT CTG-4

**Examples of CTG's Key Alliances**

Hardware	IBM Digital
Systems Software	Cullinet Transform Logic Cortrans Miles Burke Aion Corporation DACOM Relational Technology

**10. SI Capabilities Summary**

Compared to other systems integration vendors, CTG has developed above average capabilities to participate in the market. This is particularly true in the middle of the systems integration life cycle, overall design through implementation. As mentioned in the SI capabilities evaluation, CTG's strengths are not in front-end business consulting or follow-on maintenance activities. In most areas where there appear to be some weaknesses, CTG has developed effective alliances or is rapidly on its way to building or acquiring an internal capability to meet the need. A good example is in data communications and network management where as little as two years ago, CTG had below average capabilities. The acquisition of Telecommunications Management, Inc. and the internal development of a Data Communications Group are rapidly closing that gap.

Other capabilities that work in CTG's favor as a systems integration vendor include:

- The Institute for Technical Management Training
- The Corporate Projects Office, established in 1985 to address large-scale systems development

Finally, CTG's leading-edge use of technology in the design, management, and implementation of systems gives it a competitive advantage that few other integrators from the professional services side can offer.

## 11. SI Marketing Strategy

CTG carries its philosophy of being a full-service provider into the systems integration marketing effort. While the company clearly does not have all the capabilities to support that position in house, it has made great strides in recent years through acquisitions and alliances to cover the approach successfully.

CTG stresses the importance of delivering a competitive advantage to its customers through the application of technology. It has focused its SI marketing efforts on selected industries and cross-industry markets (See Section 4).

Its large professional services client base and the large number of geographically dispersed offices allow CTG to approach the market on both a proactive and opportunistic basis.

- Responding to needs from existing clients
- Proactively selling SI services through the large number of branches

Other facets of CTG's marketing approach are described below and summarized in Exhibit CTG-5.

- Competitors - As would be expected, CTG sees Andersen Consulting, EDS, Digital Equipment, and Computer Sciences Corporation as major competitors in the systems integration marketplace. It is somewhat surprising that IBM is not on the list. As CTG's reputation in the market grows, it will be competing with the major players in the market.
- Positioning - To its customers, CTG presents itself as an organization that can combine management and consulting skills with proven and extensive implementation capabilities to provide state-of-the-art solutions. It points to its financial track record and portfolio of specialized skills as a key asset in selling contracts.
- Promotion - CTG utilizes public seminars, direct mail, client referrals, and trade shows as key avenues to spread the word about its capabilities in systems integration. To date it has done little or no advertising in general or industry trade publications. The company finds public seminars to be most effective, followed by client referrals and trade shows.

## EXHIBIT CTG-5

**CTG's SI Marketing Strategy**

- Opportunistic approach
  - Selling through branches
  - Use of corporate project office
- Positioning: full-service provider
  - Selected vertical markets
  - Functional and technical specialties
- Customer benefits
  - Competitive advantage
  - Advanced technology (systems software)
  - Reduced risk (fixed price offerings)
- Focused targets
  - Financial services
  - Industrial automation
  - Telecommunications
  - Systems conversions

Overall, CTG's marketing strategy has been evolving quite rapidly during the past three years. INPUT anticipates an increasing level of proactive selling in its targeted markets during the coming year, as well as an increased emphasis on systems integration as a tool for achieving competitive advantage through the application of technology.

**12. SI Customer Base**

Only 18 months ago, there would have been a limited number of systems integration customers to talk about. As of this writing, CTG has completed at least 15 SI projects. These clients (mentioned in Section 11) have come from both the existing customer base and newly solicited clients, where CTG seems to be getting about 40% of its SI contracts. Some clients and projects are profiled in Exhibit CTG-6.

## EXHIBIT CTG-6

**Computer Task Group  
SI Project Examples**

Company	SI Project
North Star Steel	Plant-wide support system
Public Service of NM	Power plant monitoring system
Unisys	Air Force weather station support
UPI	New facilities development
Baxtor Travenol	Warehouse automation
Norton	Furnace monitoring system
Cleveland Clinic	Medical management system
USX/Pohang Steel	Data center consolidation

One of the SI projects currently underway within CTG is for the Cleveland Clinic. The project will involve 60 to 70 people to develop an integrated medical management system. The project is in the range of \$25 million and will utilize specially licensed or acquired state-of-the-art estimating, planning, and development tools to reduce the overall project risk. This project and the USX/Pohang Steel project are two of the largest undertaken by CTG thus far, and will provide additional insight into CTG's ability to compete in the large project marketplace.

**13. Summary and Future Directions**

Although CTG does not have the in-house capability to offer the full range of SI services, the company has formidable capabilities and is moving rapidly to cover any areas of weakness.

CTG has a superior set of in-house developed system software tools for project management, software development, and conversions. In addition, the company's broad geographic coverage in the U.S. lessens dependence on the financial climate of a particular industry or region.



The large well-trained systems engineering staff is a formidable asset that only the largest players including Andersen Consulting, IBM, DEC, EDS, etc. can match. While finding and developing these individuals is expensive, CTG seems to have put together a strong organization with superior qualities.

CTG's penetration of Fortune 500 firms (leading banks and financial services firms, and top utilities, and telecommunications companies) indicates a solid sales capability and account control mechanism, all for a company that is not widely known and until recently with a limited set of SI capabilities.

Finally, CTG has recognized areas of weakness in its delivery capabilities for SI and is filling them through acquisitions and alliances.

All of these assets support the rapid expansion of CTG's systems integration business. The only areas of weakness appear to be in applications software, where to INPUT's knowledge CTG has few packages and a limited set of alliances.

A second area that will require some work is marketing. Market presence and image are rapidly becoming prerequisites for success in systems integration. While CTG has a strong image as a contract software developer, it will need to pay more attention to making itself known as a systems integrator in the marketplace. INPUT believes that the key will be to build a track record of reference accounts that support the firms strategy.

To be a major player, INPUT believes that CTG should move in several areas:

- It must continue to fill voids in its portfolio of SI capabilities.
- CTG needs to broaden its market focus to include more SI prospects, which means acquiring more vertical-industry expertise at the consulting and applications package levels, and increasing the depth of expertise in markets already served.
- The company also will need to more actively sell SI at the branch level.

Overall, CTG is a player who is likely to be in the majors within a few short years. It is a firm to be watched. Assuming that it can afford to make some of the investments suggested above, the future looks bright.



## COMPANY PROFILE

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### Coopers & Lybrand

#### 1. Key SI Contacts

Samuel Ruello  
Vice Chairman  
Coopers and Lybrand  
1251 Avenue of the Americas  
New York, NY 10020

#### 2. Description of Principal Business

Coopers & Lybrand (C&L) is a private firm of accountants and technical/engineering advisers that provides a wide range of accounting and audit, professional services, and management consulting to business, industry, and government. C&L's management consulting services unit also provides systems integration services, which are described in this profile.

C&L declined to disclose any revenue data, noting that C&L does not track SI revenues separately at this time.

#### 3. Competitive Position

C&L gains a competitive edge in the availability of highly marketable and specialized capabilities within the organization. Some of these capabilities are:

- A full systems design, development, and implementation capability using CASE and advanced project management techniques
- A wide range of technical and advisory industry skills developed through C&L's long experience as an auditing and management consulting firm
- Expertise in connectivity solutions—client/server and other distributed processing technologies
- Architecture reworking to modernize applications
- Data base expertise, especially in relational systems
- Network management skills
- Expertise in advanced technologies and applications, especially in image processing/multimedia, artificial intelligence, and object-oriented programming systems

One characteristic of any vendor growing out of an accounting/auditing firm is the conflict that arises when an auditing firm decides to compete with its clients.

#### 4. Markets Served

C&L's primary SI targets are vertical markets in which it has developed special expertise. Exhibit C&L-1 lists C&L's primary target industries.

EXHIBIT C&L-1

#### C&L's Target Market Opportunities

- Vertical markets only
  - Manufacturing
  - Telecommunications
  - Retail and distribution
  - Financial services, especially insurance and investment
  - Health care
  - Federal government

In addition, C&L focuses on geographically centered markets such as oil and gas in the southwestern United States and higher education in the Boston metropolitan area.

As a conservative business entity, C&L looks first for clients in areas where C&L has recognized industry expertise. Secondly, it looks for requirements with the greatest market potential.

#### 5. Recent Events

With its background as an accounting/auditing and management services consulting firm, C&L is reluctant to disclose its work for clients.

In 1989, C&L acquired Computer Assistance, Inc. of Hartford, CT. This acquisition will increase C&L's strength in the SI marketplace.

## 6. SI Organization

C&L conducts all its SI operations under the management of Samuel Ruello, Vice Chairman and head of C&L's Management Consulting Services unit. Commercial and federal SI efforts are separated, under George Van Ness and Phil Odeen, respectively. C&L's organizational structure is deeply matrixed, with geographic regions managed by partners in charge of each region. Other managers head areas of specialized industry expertise. Exhibit C&L-2 illustrates C&L's regional/industry/functional management matrix.

EXHIBIT C&L-2

**C&L's SI Management Matrix (Partial)**

Regions	Industries	Functions
Northeast	Manufacturing	Business strategy services
New York Metro	Financial services	Information technologyservices
Atlantic	Insurance	Resource and enterprise services
Midwest/Central	Health care	
Southwest	Retail and distribution	
West	Telecommunications	
	Federal	

Although separately managed, both the commercial and federal SI operations follow the same approach to management of SI businesses, as presented in Exhibit C&L-3.

## 7. SI Business Objectives

C&L's business objectives in pursuing SI work are listed in Exhibit C&L-4. It is interesting to note that C&L ranked all the objectives as primary and none as secondary.

The objectives listed above are very much in line with the pragmatic nature of C&L's background and reflect the fact that C&L does not pursue SI business as an adjunct to another business.

EXHIBIT C&amp;L-3

### Centralization/Decentralization of SI Business Functions—C&L

Responsibilities	Commercial	Federal
Strategy, long-range planning	B	B
Marketing and promotion	C	C
Account management/sales	D	D
Contract review/approval	C	C
Project management/control	D	D
Implementation/development	D	D
Hardware/software acquisition	C	C

C=Centralized, D=Decentralized, B=Both

EXHIBIT C&amp;L-4

### C&L's Stated Business Objectives

Objective	Primary/Secondary
Revenues/profits resulting from SI work	Primary
Response to customer demands	Primary
Control of account base	Primary
Strengthen C&L's non-SI business	Primary

### 8. SI Capabilities Evaluation

C&L offers a wide range of SI services that includes: business and management consulting; systems design, development, and implementation; education, training, and documentation; selection, evaluation, and acquisition of off-the-shelf and custom equipment, software, and telecommunications facilities and services; network management and operations; and software maintenance. C&L rates itself in each area as shown in Exhibit C&L-5.

## EXHIBIT C&amp;L-5

**SI Business Capabilities/Products Evaluation--C&L**

Capability	Strength	Alliance
Business consulting	High	No
Design methodology	High	No
Design/integration	High	Yes
Project management	High	Yes
Software development	High	Yes
Education/training/documentation	Medium	Yes
Packaged applications software	High	Yes
Packaged aystems software	High	Yes
Standard computer hardware	Medium	Yes
Custom computer hardware*	Medium	Yes
Communications hardware*	Low	Yes
Network management/operation	Low	Yes
Software maintenance	High	Yes

\*Capability only—no products

It is worth noting that C&L offers no equipment service and repair at this time; thus, it is not listed in Exhibit C&L-5. It should also be noted that C&L rates its in-house capability in several areas as "low," thus increasing the value of its alliances in those areas. In the critical management services/management consulting areas, however, C&L rates the values of its capabilities as high.

C&L is currently a relatively small SI services vendor. Although C&L did not offer any revenue data, INPUT estimates C&L's total SI business at less than \$50 million. INPUT expects C&L to continue to follow a conservative path toward growth in the SI business, as it would in its management consulting business. Thus, its growth will be slow but steady—based increasingly on demonstrated successful completion of SI projects.

## 9. Strategic Alliances

C&L uses strategic alliances to buttress its areas of competitive weakness. Thus, in C&L's business consulting and project management areas, C&L feels no need for cooperative partnerships. In other areas, however, C&L clearly pursues coverage that permits it to propose a total system solution (except for equipment service and repair services).

In general, C&L's strategic alliances provide:

- Complementary skills
- Computer and communications equipment
- Software packages
- New or advanced technology
- New markets, through lead sharing

Thus, through its alliances C&L gains a competitive advantage.

C&L uses both ad hoc and long-term arrangements. Arrangements with hardware and software vendors tend to be long-term and complementary; they may include lead generation, access to software, and training. Some examples of strategic alliances used by C&L are identified in Exhibit C&L-6.

EXHIBIT C&L-6

### Limited Sample of C&L's SI Alliances

Company	Purpose of Alliance
IBM	Business partner
DEC	Business partner Electronic data interchange
Panosophic	CASE tools
Cadre	CASE tools
J.D. Edwards	Packaged software, training, demonstration
Software 2000	Packaged software, training, demonstration
Various data base vendors	Packaged software, training, demonstration
FILENET	Image processing technology
Wang	Image processing technology



## 10. SI Capabilities Summary

C&L offers a complete set of SI services capabilities, with the exception of equipment service and repair.

C&L's strategic alliances strengthen its areas of weakest capability. They are well-chosen to strengthen C&L's services offerings, increase the scope of its product offerings, and generally improve C&L's competitive advantage in the SI market place. C&L's areas of greatest weakness are in the evaluation of communications hardware and in network management and operations. In both areas, however, C&L has arranged for supporting alliances.

C&L's chosen market focus is in certain vertical industries. C&L has developed alliances with equipment vendors (IBM and DEC) to provide equipment; alliances with other (primarily software) vendors provide strength in technological areas where C&L does not have products or experience and expertise.

By focusing on selected vertical industries, C&L can now compete in its areas of greatest strength. As it gains experience, however, in other areas of the SI market, INPUT expects C&L to increase both the dollar value and the breadth of its participation in the SI market.

## 11. SI Marketing Strategy

C&L's marketing strategy is tightly focused on vertical industries in which C&L has a primary expertise (listed in section 4, Markets Served, above). C&L has developed its SI marketing emphasis as a response to the following perceived industry trends:

- A need to transfer project risk to an outside entity
- A need to increase control of systems development projects
- A need to reduce life cycle costs (and short-term costs)
- Increasing complexity of computer equipment, software, and networks

With its highly matrixed organization (described in section 6, SI Organization, above), C&L has ensured that all its selected industry markets receive the same level of service from the functional areas that support its SI operations. Also, adding additional vertical industries to its target markets will not require great changes to C&L's organization.

- Competitors - C&L competes with the vendors identified in Exhibit C&L-7.

## EXHIBIT C&amp;L-7

**C&L's SI Competition**

Commercial Market	Federal Market
Big 6 Accounting Firms	Big 6 Accounting Firms
CSC	CSC
EDS	EDS
Hardware vendors	Hardware vendors
	Software vendors

C&L has targeted vertical industries in which it can use the expertise it has developed in its professional services consulting history. It should be noted that others of the Big 6 claim to have similar expertise in some of the same industries.

- Positioning - C&L positions itself as a full-service firm. To its clients, C&L wants to provide all SI services, including facilities management. It is worth noting that C&L is a professional services firm with strong management consulting capabilities, and not a producer of computer equipment or software. With its alliances, however, C&L can provide all the services it chooses to propose.
- Promotion - C&L uses all normal forms of promotion, including telemarketing, other than television advertising and advertising in general business publications. C&L finds word-of-mouth referrals and telemarketing most effective. In both commercial and federal SI marketing efforts, C&L gains more than half its new business from its existing customer base. About one-third of its new business is gained from a combination of telemarketing and leads from its alliance partnerships.

**12. SI Customer Base**

Consistent with its background as a conservative accounting/auditing firm, C&L declined to provide any data on SI revenues or project history. It is worth noting, however, that in the vertical markets that C&L pursues, 70% of C&L's SI projects concern mainframe-based systems; 30% of projects concern distributed systems. Also, more than half of C&L's SI contract value derives from professional services; 15% derives from equipment, and 25% derives from packaged software.

### 13. Summary and Future Directions

C&L's greatest strengths lie in its management analysis capability and in its great expertise in its target vertical markets. If it selects its target projects carefully, C&L should easily succeed in the SI market. C&L's areas of greatest strength are in the management consulting and analysis areas. C&L has developed strategic alliances with producers of a wide range of computer equipment and software that permit C&L to act as a single-source SI services vendor.

C&L's self-described current weakness in the areas of custom computer hardware, communications hardware, and network management/ operations are all easily overcome by carefully choosing a complementary alliance partner. Thus, INPUT expects that C&L will more effectively compete in the SI market than its own conservative ratings would suggest.



# Company Profile

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## Control Data Corporation (CDC)

### 1. Key SI Contacts

Mr. E. E. Randol  
General Manager  
Open Systems Sales  
Computer Products Group  
Control Data  
Box 0  
Minneapolis, MN 55440-4700  
Phone: 612-853-4687

### 2. Description of Principal Business

Control Data Corporation was founded in 1968. The company grew to be a leader in the production of high-performance computing systems and peripheral products. During its early growth years, CDC branched out into a variety of related and unrelated businesses, including financial and on-line educational and research systems.

Following a number of years of disappointing financial performance, the company began a process of trimming its size and refocusing resources into its core business.

The company is active in a number of markets including: mainframe, mini-, and desktop computing systems; peripheral products, and business and information services, including systems integration.

CDC has been providing systems integration services in the federal sector for the past twelve years and in the commercial sector for five.

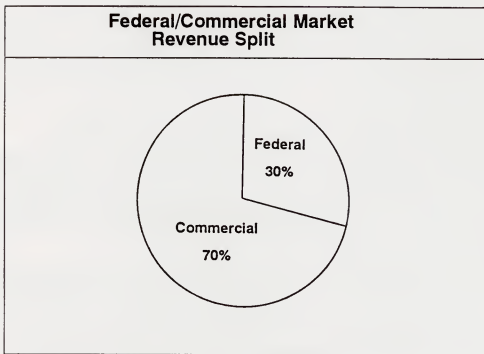
### 3. CDC Competitive Position

Between 1989 and 1990, CDC's systems integration revenues declined by approximately 19%, to \$637 million. However, during the same period, systems integration's share of total corporate revenue grew from approximately 21% to 30%, reflecting the company's increased interest in the services market.

#### 4. Market Served

Like many hardware-based companies, CDC has been active in the federal market for many years. As the commercial market began to emerge, CDC worked to leverage its federal expertise into the commercial market. As shown in Exhibit CDC-1, CDC currently derives 30% of its systems integration revenues from the federal market.

Exhibit CDC-1



Control Data targets primarily vertical markets, as shown in Exhibit CDC-2. Services provided to each market varies considerably.

## Exhibit CDC-2

**SI Vertical Market Focus**

- . Marketing
- . Electric Utilities
- . Telecommunications
- . Federal Government
- . Business Services

With the exception of the business services market, CDC focuses on services closely associated with high-performance computing. Manufacturers need high-performance computing for CAD/CAM. Electric utilities need high-performance computing for network design, analysis, and control.

Within the business services sector, CDC provides on-line data base services and financial services such as accounting and payroll.

**5. Recent Events**

In March 1991, CDC's Computer Products Division announced a \$14 million contract with the Internal Revenue Service (IRS) for 11 CYBER 932 computer systems and services. The systems will be used for high-speed printing of large volumes of data at the ten IRS Service Centers located across the United States.

In May 1991, CDC's Government Systems Division and Computer Products Division teamed up to win a \$6.5 million contract to develop a NASA space shuttle mission modernization plan called FADS (Flight Analysis and Design System). CDC will install a distributed network, using off-the-shelf computer hardware and software, as well as providing support services to the Johnson Space Center in Houston, TX.

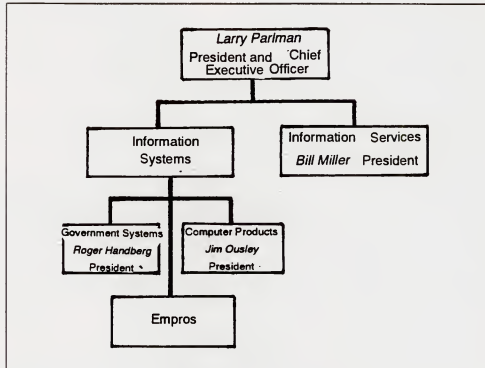
**6. CDC Organization**

CDC is organized into two business groups: the Information Systems Group and the Information Services Group (see Exhibit

CDC-3). Within the Information Systems Group are three divisions: the Government Systems Division, Computer Products Division, and the Empros Division. Systems integration is performed at all CDC divisions on several different levels, whether as an embedded system on a military aircraft, or a full-scale computer systems integration for a commercial business.

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Exhibit CDC-3



The Government Systems Division supplies computer systems, peripherals, software, training and related services to the U.S. Department of Defense, the National Aeronautics and Space Administration (NASA), and like agencies of U.S. allies. Although this division deals primarily with defense agencies, it is trying to broaden its scope to include some of the civilian agencies as well. The Computer Products Division provides computer systems and services to both commercial and federal clients worldwide. The Empros Division specializes in energy power systems and training simulators.

The Information Services Group works primarily on providing marketing information, business management, financial management, and network information services to the commercial sector.



## 7. SI Objectives and Revenues

Control Data's systems integration objectives reflect the trend among equipment manufacturers to place greater attention on services. The company indicates that it participates in systems integration in response to customer requirements and expects its SI business to be self supporting. Follow-on hardware and software sales are of only secondary importance.

While CDC's systems integration revenue declined between 1989 and 1990, the percentage of overall corporate revenues increased, from 21% to 30%. The company expects continued growth in both the federal and commercial sectors, with its commercial business growing at a significantly higher rate. Commercial business revenue is expected to grow at an estimated 20% per year for the next five years. During the same period, the federal business is expected to grow at only 5%.

The company reports revenues of \$600,000 for 1990. Of this, 30% is derived from federal and 70% from commercial. Seventy percent of CDC's revenues is derived by acting as a prime contractor. Twenty percent is derived from its role as a sub-contractor. An additional 10% is derived from CDC's participation in projects where the customer is the prime contractor.

The company indicates that it is currently experiencing gross profit margins of 5%-10% for systems integration services. However, like most companies in systems integration, it is experiencing an erosion of the profit margin. Like most companies, CDC realizes the greatest margins from development activities such as consulting, design, and software development.

Of CDC's commercial revenue, half is derived from its existing client base and half from new clients. Within the federal market, 70% is derived from new contracts.

## 8. Internal SI Capabilities Evaluation

The company currently has nearly 4,500 people assigned to support systems integration activities. Of the total, 3,200 are assigned full time to systems integration activities. The remainder are assigned to meet specific project or contract requirements.

Of the total personnel supporting systems integration activities, 30% are associated with systems development and 20% are associated with project management. Management and planning, administrative support, and hardware selection each represent 10%

of the staff. The company reports that 17% of the staff are devoted to sales.

As with most companies, some activities are centralized and some are decentralized. Marketing, account management, and administrative functions, such as legal, are centralized. Activities that relate directly to performing customer work are decentralized. The company reports that the same basic structure applies to the federal and commercial sectors.

### 9. SI Strategic Alliances

While CDC has internal capabilities in most technical disciplines, the company does have a formal program of alliances. In the short term, CDC's alliance program is geared to provide products and services to CDC that it can then deliver as a complete solution. In the longer term, the company expects to involve its alliance partners more directly in customer contract activities.

The company has both long-term alliances and those established to meet a specific short-term need. Longer term alliances have been established to meet hardware and system software requirements. Application software needs are met through short-term alliances.

The company notes the following alliances:

- . MIPS Compiler Systems
- . Silicon Graphics
- . Lynx
- . Micro Focus
- . Kuch & Associates

### 10. SI Marketing Strategy

As noted in Exhibit CDC-3, the company targets several specific vertical markets. It does not expect this to change. These markets were selected based on CDC's knowledge of the business, growth potential, and the overall competitive environment.

The company pursues a fairly traditional approach to marketing. The majority of CDC's marketing efforts are directed toward seminars, trade shows, direct mail, and client referrals. Only selected advertising is done. As with most companies, client referrals are valued highly.

Approximately 30% of CDC's federal and 50% of its commercial contracts result from client referrals. About 50% of contracts for each sector result from responses to requests for proposal. An additional 20% of commercial contracts result from proactive lead generation.

As shown in Exhibit CDC-4, CDC competes with major vendors in both the commercial and federal sectors.

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Exhibit CDC-4

**Key SI Competitors**

<i>Commercial</i>	<i>Federal</i>
Andersen	EDS
EDS	CSC
IBM	IBM Federal

The company believes that there are a number of areas where its proprietary technology provides a competitive advantage. These include technologies related to disk array, engineering design management, archive and storage arrangement, and heterogeneous networks.

**11. SI Customer Base**

As with other companies, CDC reports there is considerable difference between the size of contracts in the commercial and federal sectors.

The value of commercial contracts range from \$6-\$8 million. Federal contracts average approximately \$100 million. For both the commercial and federal sector, equipment represents approximately 40% of the contract value, packaged software and professional services each represent about 30% of the total value.

The revenue split between centralized and decentralized systems follows the industry trend toward downsizing. Approximately 30% is for mainframe-based systems and 70% is for distributed systems.

The company provides the following examples of the type of contracts currently active.

- . Canadian Government - Defense communications system
- . U.S. Government - Army Corps of Engineers Automation Project
- . U.S. Government - CANTASS Anti-Submarine Warfare System
- . U.S. Government - AWACS Air Force Early Warning and Control System
- . U.K. Government - National Electric Utility Grid Control
- . Tennessee Valley Authority - Network and mail integration
- . Minnesota State Lottery - Statewide automated lottery system

## 12. Summary and Future Directions

Control Data has focused on high-performance computing to develop its systems integration business. This has been productive for two reasons:

- . First, it capitalizes on internal expertise and market reputation which CDC has acquired in this area as a result of its Cyber line of high-performance products.
- . Second, it focuses CDC's resources into a market segment that many other integrators have not attempted to service. CDC has, therefore, enjoyed a good market share in this area.

Since SI is becoming a larger share of total corporate revenues at CDC, reflecting an increased interest in the services market, CDC will have to expand into other sectors to continue to strengthen its position in the SI market. It needs to creatively leverage its strong position in the information and business services market into systems integration engagements in order to remain a strong systems integrator. CDC, in effect, has to create a specialty integration market in this area, just as it has in high-performance computing.

## COMPANY PROFILE

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### Digital Equipment Corporation (DEC)

#### 1. Key SI Contacts

Russ Gullotti  
Vice President  
Corporate Services  
Digital Equipment Corporation  
Nine Executive Park Drive  
Merrimack, NH 03054-0430

#### 2. Description of Principal Business

The Digital Equipment Corporation (DEC) is the best known minicomputer manufacturer in the U.S., offering a wide range of equipment and software, ranging from small microcomputers suitable for laboratory data collection and analysis, to larger midsize machines and mainframes often used to support departmental information systems along with office automation capabilities, including electronic mail.

Also, DEC provides the following services:

- Computer services (facilities management, disaster recovery, and hardware rentals)
- Professional services (network planning and implementation, site planning, education, training, and systems integration)
- Financial services (principally leasing)
- Systems integration (program management, custom hardware and software, and third-party hardware and software)
- Product services (both DEC and non-DEC)

Based on total 1989 revenues (\$13 billion), DEC is the second-largest computer vendor in that industry.

Without question, DEC holds the leadership position in midrange systems. Over the past five years it has capitalized on its strengths in departmental and distributed computing, enabling it to expand beyond its traditional emphasis on scientific and technical computing to include the general office and administrative applications. Over the past few years, DEC has shifted its focus from satisfying minicomputer-based departmental information requirements to providing mainframe-based enterprise information capabilities.

Although DEC operates in virtually all industry sectors, primary industry markets for DEC include telecommunications, education, federal government, aerospace, automobile manufacturing, banking and finance, health care, and process manufacturing.

In 1989, DEC was a \$13 billion business overall. INPUT conservatively estimates DEC's overall 1989 U.S. SI business at about \$333 million. INPUT's analysis suggests that a figure closer to \$1 billion may well represent DEC's Enterprise Integration Services group's worldwide revenues, which include revenues from non-U.S. operations and from professional services not included in INPUT's current definition of SI services.

INPUT believes it to be accurate to divide DEC's business revenues between commercial and federal business at roughly 84% and 16%. Thus, INPUT estimates that DEC's commercial and federal SI revenues for 1989 were approximately \$230 million and \$45 million, respectively, as shown in Exhibit DEC-1.

EXHIBIT DEC-1

**DEC Systems Integration  
Revenues, 1989**

Business Component	\$ Millions
Federal	45
Commercial	230

### 3. Competitive Position

DEC, as a major minicomputer vendor, has been offering a systems-oriented (hardware and software) solution to its customers for many years. This sales position, coupled with its internal and custom software development activities, made the move into large-scale SI efforts a natural undertaking. DEC is aggressively pursuing SI business in the hundreds of thousands to multimillion-dollar range and sees as its competitors IBM, Andersen Consulting, and EDS. It competes with these vendors in both its federal and commercial business pursuits.

In addition to DEC's general financial health, DEC's primary competitive advantage is its integrated computer architecture, which permits modular systems expansion and software compatibility across hardware/software platforms. In addition, DEC benefits from an extensive library

of third-party and in-house-developed applications software and the growing use of its equipment in general-purpose departmental environments. Additional advantages include:

- An integrated office automation offering, All-In-One
- Sound fiscal management and an enthusiastic user community.

DEC continues to seek an increasing presence in the worldwide SI market; it accomplishes this by increasing the number of its target industries and increasing the scope of its strategic alliances.

#### 4. Markets Served

DEC markets its products and services to worldwide vertical industry markets; however, Digital has chosen to focus its Enterprise Integration Services efforts in the following vertical markets:

- Process industries
- Discrete manufacturing and engineering
- Finance and services industries
- Telecommunications and networking
- Federal agency requirements

The primary motivation for participating in these markets is existing customer demand. INPUT expects that the range of industries serviced will grow as DEC sees opportunity or loss of account control in any particular industry. In addition to the markets cited by DEC, it appears that DEC will continue to take a strong position in engineering and scientific, artificial intelligence/expert systems, and office automation cross-industry sectors for both SI and non-SI opportunities. Exhibit DEC-2 summarizes DEC's primary SI market opportunities.

EXHIBIT DEC-2

#### DEC SI Target Market Opportunities

Vertical	Cross-Industry
Finance & Services	Office Automation
Process Manufacturing	Artificial Intelligence
Discrete Manufacturing	Engineering and Scientific
Federal and State Governments	
Telecommunications	

As a manufacturer itself, DEC brings to its manufacturing-oriented systems integration efforts experience and understanding that are very difficult for a purely professional services contractor to obtain.

### 5. Recent Events

In early 1989, DEC formed the Enterprise Integration Services (EIS) Group, bringing together 18,000 employees who had been doing SI work and putting them into a single organization under a corporate vice president, EIS Group VP, Russ Gullotti.

In 1990, DEC EIS established its Digital Service Alliance (DSA) Program. Under the DSA Program, DEC enters into strategic alliances with other vendors whose capabilities complement DEC EIS' with respect to various potential clients' SI requirements. In addition:

- In January, 1988, DEC and Apple declared a joint venture that has subsequently provided a solid architecture linking their respective products.
- Over the past few years, DEC has invested significant amounts in hiring experienced consultants and professional services personnel from the Big 8 and other professional services companies whose primary business has been in the "solution" selling and delivery businesses.
- In March, 1989, DEC won one of its largest SI contracts for automation of a Boeing sheet metal fabrication facility.
- Over the last year, DEC established a set of alliances with companies that have manufacturing consulting capabilities. Included among these are Deloitte Touche, A.D. Little, Andersen Consulting, Ernst & Young, and Price Waterhouse.
- In 1989, DEC won the network management component of the Kodak outsourcing contract. DEC is clearly a leader in network integration and management; this contract was a major event in the 1989 information services market.
- In 1990, DEC won a major CIM contract to rebuild the production and business planning systems for Nissan's Smyrna, Tennessee truck plant. DEC also won multimillion dollar SI contracts at BIMCO, Deutsche Telepost, Canada Post, Bankers' Trust, and Tyson Foods.
- In November, 1990, DEC EIS formed a new Consulting Services Business unit as a direct response to the demand for high-level consulting coming from DEC customers and as a key component in DEC's effort to enhance the business partnership with its customers.

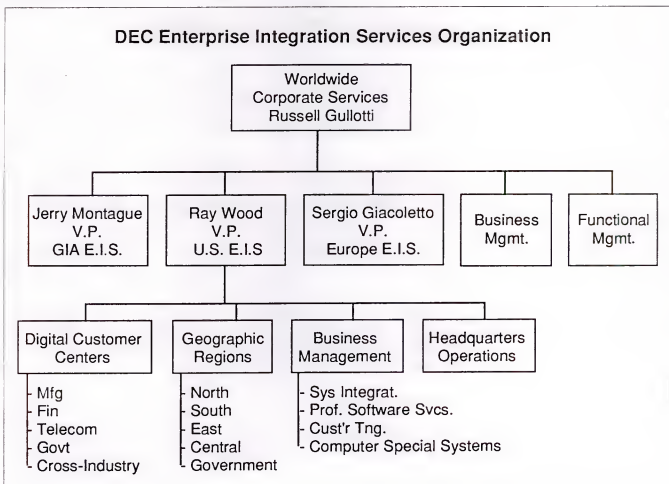


- In November, 1990, DEC announced that it was proceeding with a \$60 million SI effort for an unnamed petrochemical process manufacturer in England.
- In December 1990, DEC announced that Russ Gullotti would manage a combined services organization consisting of both Customer Services and EIS organizations.

## 6. SI Organization

DEC has traditionally operated using a matrix organization; the EIS group is no exception. Exhibit DEC-3 illustrates the DEC EIS organization.

EXHIBIT DEC-3



- The Digital Customer Centers (DCCs) provide a full range of support services to the field sales organization. These centers are industry focused and include:
  - Application Centers for Technology (ACTs), which provide focused industry applications and emerging technology support expertise
  - Management consulting capability
  - Systems integration resources
- The geographic regions are responsible for managing EIS support to the geographically dispersed product sales organization.
- Business Management focuses on service or product excellence. For example, the SI Business Manager is responsible for methods, tools, and training for SI resources.

DEC has strong ties to the manufacturing industries—particularly automotive, aerospace, and process. It has historically sold at the department level in engineering and on the plant floor. Because this is such an important part of its business, DEC has established three DCCs for manufacturing. They are:

- Detroit, Michigan—focus on automotive applications
- Santa Clara, California—focus on aerospace
- Atlanta, Georgia—focus on process manufacturing

Other DCCs within the United States are:

- Washington, D.C.—focus on government systems
- Landover, Maryland—focus on telecommunications and marketing, and cross-industry applications
- New York City—focus on finance and service industries

## 7. SI Business Objectives

Russ Gullotti, DEC's Vice President in charge of all DEC's Corporate Services, including the Enterprise Integration Services (EIS) Group, announced in November, 1990, that DEC's objective in the SI market place is to become the "#1 world class systems integrator," that is, to be the leading systems and support integrator, encompassing the full range of business needs in an integrated, multivendor, enterprisewide environment.

As a result of this announcement, DEC clearly continues the shift in its approach to meeting its customers' needs from hardware and software solutions, to enterprisewide systems and services solutions. Likewise, for the DEC EIS, SI services are no longer an adjunct to the sales and maintenance of computer equipment and software. SI services have become the primary focus of the organization.

Against an SI industrywide growth forecast of not more than 20% per year, DEC EIS is planning on 25% growth.

## 8. SI Capabilities

DEC offers the full range of SI services. Consulting, design/integration, project management, hardware, communications products, systems software, etc. In particular, DEC has a wide range of specific telecommunications-oriented SI capabilities. Its strong financial position and growing capability to understand the risk management associated with SI make it a credible competitor. INPUT evaluates DEC as follows:

- **Business Consulting**—At one time a weak area, DEC is investing significantly to increase its capabilities in this field. Its Enterprise Planning & Design Services are focused on enterprise planning and the identification of strategic opportunities. Partners and alliances are used in this area, but DEC continues a campaign to acquire this skill by hiring or allying with experienced practitioners to operate in both a marketing and a consulting capacity.
- **Design Integration**—DEC has established a reputation for being able to integrate its offerings with those of other computer hardware and communications equipment manufacturers. This is one of DEC's real strengths. In addition, the unified nature of DEC's own product architecture is an advantage. Integration at the network level is DEC's major strength.
- **Project Management**—INPUT believes that DEC has demonstrated strong skills in the project management area. DEC has also invested heavily in developing a program management approach that should strengthen its capabilities in this area for jobs like the Boeing project.
- **Software Development**—DEC has extensive (perhaps the most) experience in developing applications software for minicomputers. Even though in-house expertise might be limited in some vertical markets, DEC's strong network of alliances and third-party developers has produced a full range of applications for DEC platforms.
- **Education, Training, and Documentation**—DEC has a highly developed system for education and training, and is probably better than most at being able to deliver this service flexibly.

- **Packaged Applications Software**—There are hundreds of third-party suppliers that develop software for the DEC environment. INPUT believes that DEC has strengthened its ability to create continued interest in developing packages for its platforms.
- **Standard Computer Hardware**—DEC's integrated VAX/VMS architecture and workstation line give DEC a complete offering in the on-line applications systems market.
- **Communications Hardware**—DEC's line of communications equipment is targeted primarily at DEC proprietary environments. DEC, however, provides communications systems software that permit DEC systems to communicate effectively with almost all standard network environments.
- **Network Management and Operations**—DEC is a leader in managing worldwide networks and providing network management software. Although DEC has, in the past, dealt mostly with homogeneous DEC networks, INPUT believes that DEC's commitment to communications standards and its increasing presence in the SI market will force DEC to deal more often with heterogeneous communications networks.
- **Service and Repair, Software Maintenance**—This is another of DEC's strengths. Through its Vendor Equipment Services offering, DEC is servicing heterogeneous environments for 14,000 products and applications representing over 800 vendors.

## 9. SI Strategic Alliances

DEC EIS has entered into strategic alliances with other SI services vendors whose capabilities complement DEC EIS'; these alliance agreements also allow DEC EIS to respond to clients' solicitations much more rapidly, eliminating the normal search time for matching skills and availability. Current strategic alliances are listed in Exhibit DEC-4.

DEC uses alliances in virtually all aspects of its SI business. Key alliances are performed within the Service Alliance Program and are negotiated on a supplier-by-supplier basis. In DEC's own words, the program is presented to the customer environment as follows: "Building the best solution for a customer's enterprisewide project requires many components. Creating and delivering that solution may require the use of third parties."

The program provides for formal relationships with leading service suppliers in selected technologies, industries, and application areas and it enhances the breadth, depth, and capacity of DEC total solution services. It conveys to customers that DEC can be the single source for their companywide service needs.

INPUT notes that DEC also has hundreds of alliances for applications software and other services.

## EXHIBIT DEC-4

**DEC**  
**Limited Sample of SI Alliances**

Alliance	Purpose
Andersen Consulting	Distribution and Logistics industries
Apple	Computer-integrated manufacturing (CIM)
CACI, Inc.	CIM
CSC	CIM; Distribution and Logistics industries telecommunications
Deloitte and Touche	CIM; Discrete Manufacturing; Process Manufacturing
Ernst & Young	Health Care
A.D. Little	CIM; Chemical; Pharmaceutical industries
Morrison-Knudsen Engineering	Computer Integrated Manufacturing
Price Waterhouse	F&A; Process Industries; EDI
SHL Systemhouse	CIM

Other alliances may be formed on a project-by-project basis.

### 10. SI Capabilities Summary

DEC has a full array of capabilities to compete in the SI marketplace.

Major strengths are the breadth and depth of DEC's alliances and increased customer orientation. INPUT believes that DEC has shown itself to be capable of managing very large projects and of managing risk.

A former DEC weakness was a perceived lack of vertical industry expertise outside the scientific/technical areas. However, DEC's many alliances with partners that provide the needed expertise in other industries, combined with DEC's focused Digital Customer Centers, are overcoming this weakness.

Exhibit DEC-5 summarizes INPUT's current assessment of DEC's SI capabilities.

EXHIBIT DEC-5

INPUT's Evaluation of DEC's SI Capabilities	
Strengths	Weaknesses
Integrated VAX/workstation architecture	Perceived lack of ability in non-targeted vertical industries
Selection, acquisition, and maintenance of third-party equipment	
In-house technical expertise	
Geographic coverage	
Depth/breadth of alliances	

## II. SI Marketing Strategy

DEC has increasingly broadened its SI services marketing strategy to include larger and larger projects in its worldwide markets. DEC now sees itself as potentially the leader in the worldwide SI market; DEC intends to achieve that position through growth resulting from performance. As a systems integration services vendor, DEC can propose combinations of DEC and other manufacturers' equipment and software in whatever combination best meets the clients' needs.

DEC has described its strategy very simply as the following:

- Build a foundation
- Target the market
- Develop service alliances
- Deliver globally

DEC has built its foundation: the DEC EIS organization. DEC has targeted its desired market: all vertical industries worldwide. DEC has developed a wide range of alliances with complementary services vendors that permit DEC to propose all required SI services. DEC now expects to grow through its performance in the worldwide SI market.

- Competitors. In prior years DEC has declined to identify its competition as a matter of policy. This year, however, DEC identified IBM, Andersen Consulting, and EDS as its major competitors in both the

commercial and federal SI markets. It should be noted that DEC, as other SI services vendors, will compete with another vendor and then later join in an alliance with that vendor for a different project.

- **Positioning.** DEC has positioned itself as the leading worldwide provider of network computer systems by offering a full range of computing solutions for integrating the entire enterprise from the desktop to the data center. It leverages its use of alliances much more effectively than many of its competitors.
- **Promotion.** DEC utilizes all forms of promotion with the exception of direct mail and television advertising in the marketing of systems integration services. Clearly, the company feels that the most effective promotional device is the referral. DEC uses its internal worldwide network of more than 15,000 nodes and 70,000 terminals to validate its experience in networking. Other references include computer-integrated manufacturing (CIM) applications; on-line library data base networks; banking and insurance distributed processing systems; and large-scale health care systems integration projects.

DEC also maintains a responsive consultants' liaison department to positively influence independent consultants hired by companies to recommend project bidders.

DEC EIS is now pursuing a growing range of SI opportunities that can be satisfied by any combination of equipment, software, and services that it can provide. Currently, in both the commercial and federal markets, DEC EIS derives the distribution of revenue from its SI contracts presented in Exhibit DEC-6.

DEC-6

**Distribution of SI Revenue by  
Class of Service/Product**

Class of Service/Product	Percent
DEC hardware & software products	45
Third-party products and services	15
Digital services	40

In addition, DEC strategy is now to provide a complete solution within a vertical industry, rather than trying to compete for small pieces of many requirements. To this end, its strategic alliances form partnerships with services vendors who can help DEC provide complete solutions.

## 12. SI Customer Base

INPUT estimates that DEC has undertaken more than 800 SI projects over the past several years ranging in value from hundreds of thousands of dollars to over \$250 million, with an average between \$5 million and \$10 million.

Several SI efforts undertaken by DEC, for which the dollar values are known to INPUT, are shown in Exhibit DEC-7.

DEC-7

### Examples of DEC SI Projects

Company	Project Description	\$ Millions
Firestone	Computer Integrated Manufacturing (CIM)	21.0
HFSI	Paperless factory	10.0
Nissan	Paperless factory	8.0
Boeing	Sheet metal plant automation	52.0
BIMCO	International shipping network	100.0
Deutsche Telepost	Telecommunications Integration	100.0
Tyson Foods	Logistics	9.2

DEC's SI projects have encompassed applications ranging from computer-integrated manufacturing to inventory management and network integration.

In addition, major projects have been undertaken recently for the Canada Treasury Board and W.H. Smith (a London retailer).

## 13. Summary and Future Directions

DEC's strengths include its ability to manage projects involving distributed processing, networking, and communication across various vendors' processors. Network design and management capabilities are crucial to being a successful integrator; DEC scores high in this area.



Additional strengths include:

- Communications hardware and software products that enable DEC hardware to communicate with non-DEC computers
- Strong account presence through its worldwide service staff
- Financial strength, internal technical skills, and capability to manage larger-scale projects and their associated financial risks
- A rich portfolio of internally developed and third-party applications software product offerings

DEC has few perceived weaknesses, other than a potential lack of objectivity in approaching the hardware and software component issues of the solution.

INPUT believes that DEC will continue to move toward a fully matrixed, decentralized, organizational structure for administration, sales, and marketing of its SI activities. In addition, INPUT anticipates that DEC will continue to target large-scale, international, and publicly visible SI projects to enhance the reputation of its Enterprise Integration Services offering, and initiate more aggressive education of internal field personnel to help promote the SI strategy.

In summary, DEC's prospects in the SI marketplace look bright.



## COMPANY PROFILE

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### Electronic Data Systems (EDS)

#### 1. Key SI Contacts:

##### Corporate Business Development

Gary J. Fernandes  
Senior Vice President

##### Manufacturing, Warehousing and Distribution Segment

Paul Chiapparone  
Senior Vice President  
Hank Johnston  
President, Manufacturing and Distribution  
Services Division

##### Federal Government Segment

G. Stuart Reeves  
Senior Vice President

##### International and Global Industries Segment

Mal Gudis  
Senior Vice President

#### 2. Description of Principal Business

Electronic Data Systems (EDS) was originally founded in 1962 by Ross Perot to provide systems operations services to insurance companies, government-funded health insurance programs, and financial institutions. Today it provides systems operations, processing services, professional services, and systems integration services to nearly all vertical industries and to the federal government. In addition, EDS may act as a fiscal agent for a client, taking full responsibility for data processing as well as other administrative duties such as paying and processing insurance claims.

EDS is among the leaders in providing systems integration to the federal government and entered the commercial systems integration market in the early 1980s, gaining experience and a substantial lead in this area.

EDS was acquired by General Motors in 1984 and is operated as a wholly owned subsidiary. EDS provides virtually all information processing services to General Motors.

#### 3. EDS Competitive Position

EDS is the largest systems operations and processing provider in the world and had worldwide 1989 revenues of \$5.47 billion and net income of \$435 million. Approximately 55% of EDS's revenues are from captive GM business and the remainder is from systems operations and other professional services for outside clients.

EDS has a strong set of information services capabilities and resources—including consulting, development, systems integration, and systems operations. Its operational data processing experience, including developing and operating large and small data centers, makes it a real “pro” in the efficient and cost-effective use of technology. Its systems operations experience with insurance companies and financial institutions provides it with applications knowledge of these industries. The assumption of all information systems responsibility for General Motors provides it with real business experience in the manufacturing, retail, distribution, and networking areas. And its alliance with GM Hughes provides it with aerospace industry knowledge.

The purchase by GM further adds to EDS’s strengths. It provides huge financial resources to support bids, on the largest opportunities and the buying power of one of the nations largest corporations. This buying power will provide it with other vendors’ products at the lowest possible price and will result in very competitive pricing.

#### 4. Markets Served

EDS recently restructured its organization and has organizations that focus on virtually all vertical markets. Its historical focus has primarily been the following vertical markets:

- Federal government
- State and local governments
- Banking and finance
- Insurance
- Manufacturing

While EDS’s expertise is aimed primarily at vertical industries, the company has targeted two key cross-industry markets: engineering and networking—both areas where the company has gained a great deal of experience through its work at GM.

To become a major systems integrator, EDS has targeted the federal government, discrete and process manufacturing, aerospace, and retail distribution vertical markets. It is also making a major thrust at expanding this capability into the international market. (See Exhibit EDS-1). Under its new organizational structure, EDS will focus on all vertical markets.

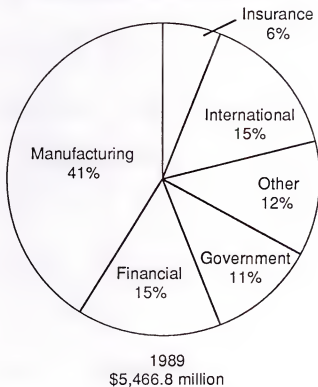
EDS’s 1989 revenues, including captive GM revenues, were distributed as shown in Exhibit EDS-2.

## EXHIBIT EDS-1

**SI Vertical Market Focus—EDS**

- Federal Government
- Discrete Manufacturing
- Process Manufacturing
- Retail and Distribution
- Aerospace

## EXHIBIT EDS-2

**Revenue by Market Sector****5. Recent Events**

In November 1987, EDS entered an agreement with Tandem Computers to jointly develop and market products and services to help manufacturers connect and integrate multivendor business, engineering, and factory control systems.

During 1987 EDS began negotiations to acquire MTech and the servicing responsibilities for the third-largest ATM (automated teller machine) network in the U.S. The acquisition was completed in 1988. In 1987 EDS also acquired M&SD Corp, a supplier of telecommunications services and equipment.

In 1987 Perot sold his interests in GM-EDS and resigned from the GM Board of Directors because of fundamental differences he had with GM's management style and system. At that time Perot agreed that he would not compete with EDS for profit for a three-year period. During 1988 Ross Perot formed a new firm, Perot Systems, focused on systems integration and a direct competitor to EDS.

In March 1989, EDS entered into negotiations to purchase 20% ownership of National Advanced Systems (NAS), the other 80% to be held by the Japanese computer manufacturer, Hitachi. This investment in the company now called Hitachi, USA provides EDS with a low-cost source of computer hardware and additional leverage to gain favorable discounts from other equipment vendors.

In early 1990, EDS entered into a potential multibillion-dollar, 10-year accord with Texas Air Corporation. EDS is investing \$250 million in the airline's System One computerized reservation subsidiary for 50% ownership. Included is EDS's management of four data centers and control of 2,200 Texas Air employees.

Recent developments are summarized in Exhibit EDS-3.

#### EXHIBIT EDS-3

### Recent Major Developments

- Tandem CIM alliance
- MTech and M&SD acquisitions
- HDS minority ownership position
- Texas Air accord

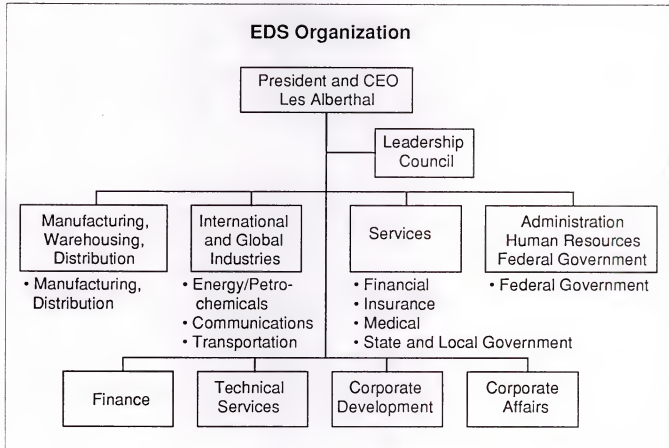
## 6. EDS Organization

In late 1989, EDS announced major changes to its organization. Eight of its senior executives were given oversight for eight major business segments and were also assigned to the new Leadership Council. The Council has been established to provide a high-level focus on strategic planning.

The reorganization also establishes a large number of business units (well over fifty), most with divisional status, with responsibility for specific market opportunities. Most of these organizations have a specific vertical industry market focus. Similar to its major competitors, EDS has recognized the importance of building solutions for each type of customer.

Exhibit EDS-4 depicts the new EDS organization and the eight major business segments. Vertical industry market responsibilities are also identified.

EXHIBIT EDS-4



In interviews with INPUT, EDS stated that it is in the systems management business and systems integration is an essential component of that business. It also stated that most of its employees have operational experience that can be applied to SI. INPUT's estimates of EDS's 1989 SI revenues are shown in Exhibit EDS-5.

## EXHIBIT EDS-5

**EDS Systems  
Integration Revenues, 1989**

Business Component	\$ Millions
Federal	350
Commercial	150
Total	500

EDS has 60,000 employees worldwide. As mentioned above, many of these employees have skills and knowledge that can be applied to SI. INPUT has not attempted to estimate the number of personnel assigned to SI, although they are distributed among the various functional disciplines as shown in Exhibit EDS-6.

## EXHIBIT EDS-6

**Distribution of SI Personnel  
EDS**

Capability	Percent	
	Commercial	Federal
Management, strategy, planning	3	1
Legal/contract administration	1	1
Project management	10	5
System development/ implementation	75	78
Hardware/software evaluation/ acquisition	10	10
Hardware engineering	0	0
Sales	2	5



When interviewed, the EDS organizations that address most SI opportunities responded quite differently as to how they were organized to execute and manage SI contracts. This is illustrated in Exhibit EDS-7.

EXHIBIT EDS-7

### Centralization/Decentralization of SI Business Functions Electronic Data Systems

Responsibilities	Commercial	Federal
Strategy and long-range planning	B	D
Marketing and promotion	C	D
Account management/ sales	C	D
Contract review/approval	C	D
Project management/ control	B	D
Implementation/development	B	D
Hardware/software acquisition	C	C
Systems operations	C	C

C = Centralized, D = Decentralized, B = Both

The Government Systems Group operates in a decentralized mode, with the exception of hardware and software acquisition and systems operations, which are controlled centrally. The commercial organizations have been more centrally controlled, with all activities except strategy and long-range planning, project management and control, and implementation and development controlled from Dallas. These three responsibilities were shared by Dallas and decentralized locations. INPUT believes that the major reason for the differences in these responses has been a result of the different customer requirements and the commercial organizations' proximity to EDS corporate headquarters.

As EDS's new organization unfolds, with its focus on more autonomy and delegation of decision authority, INPUT anticipates that commercial organization will become much more decentralized.

## 7. SI Objectives and Revenues

EDS's business objectives are identified in Exhibit EDS-8. Management has set a goal of reducing its dependence on GM business to 50% by 1990. It is attempting to accomplish this by holding GM-derived revenues level, while continuing to increase traditional non-GM revenues by around 30%.

EXHIBIT EDS-8

### EDS Business Objectives

- 50% of business from non-GM sources by 1990
- 80% renewal rate
- SI as a source of systems operations contracts
- Control of existing customer base
- Profitable SI business

EDS also has a business objective of maintaining a client renewal rate in excess of 80%. It is offering systems integration in response to its customers' demands, and recognizes it as a vehicle to attract new systems operations candidates and to maintain control over its existing customer base.

Finally, the company is looking to the SI business to earn a profit.

## 8. Internal SI Capabilities Evaluation

- Business Consulting—EDS has good consulting experience in the area of developing large projects. It has very good technical consulting capability based on its extensive systems operations experience. Vertical-industry business consulting capability should be particularly strong in its base businesses—process and discrete manufacturing, retail and distribution, aerospace, and networking—all areas of SI concentration. EDS' new organization should improve its knowledge of additional vertical industry markets.

- Design Methodology, Design and Integration, Project Management, Software Development, Education, Training, and Documentation—Based on the experience it has gained both in its basic systems operations business and at GM, EDS is very capable in all of these areas.
- Packaged Application Software—EDS has developed and acquired a number of vertical market packages that it uses in its traditional business. Examples are The Insurance Machine™ for the insurance industry and Flagship™ for credit unions. It is not clear what role these products may play in SI-only, non-facilities-management projects. EDS indicated in its survey response that it would prefer to use all off-the-shelf products.
- Packaged Systems Software—The company prefers to use off-the-shelf products provided by other vendors.
- Standard Computer Hardware—EDS uses standard off-the-shelf hardware provided by other computer manufacturers. EDS will most likely incorporate more Hitachi/NAS products in its bids.
- Custom Computer Hardware—EDS's commercial systems integration organization indicates that it has some custom hardware capability, but it would clearly prefer to use off-the-shelf hardware.
- Network Management and Operations—EDS has extensive experience in developing and managing GM networks and its own network that supports its processing services capability. Today it operates one of, if not the largest, networks in the world.
- Service and Repair—EDS has moderate capability in hardware service and repair.
- Software Maintenance—The company has adequate software maintenance capability.

## 9. SI Strategic Alliances

EDS has a formal alliance program that generally operates on a contract-by-contract basis. Alliances exist with computer hardware manufacturers, other GM organizations, customers, applications software providers, and non-U.S. partners. Examples of these alliances are shown in Exhibit EDS-9.

Equipment alliances have been established with leading vendors, including IBM, AT&T, Tandem, DEC, Sun, and Apple. The Tandem alliance includes a strong focus on the manufacturing industry. EDS's alliance with GM Hughes is focused on factory automation and telecommunications applications that require satellite-based products and services.

## EXHIBIT EDS-9

**EDS—Strategic Alliances**

Equipment	Digital Equipment IBM AT&T Apple Tandem Sun
Systems software	Ameritech
CIM/satellite products and services	GM Hughes Electronics
International SI	Lucky-Goldstar Telefonica
Large retail bank processing systems	Norwest Corporation Banc One Corporation
Airline reservation systems	Texas Air

Customer partnerships such as the EDS, Banc One Corporation & Norwest Corporation alliance are used to develop application offerings in areas where EDS lacks applications skills.

Software alliances, though small in number, have provided solid gains for EDS in the telecommunications market.

EDS has established a number of international alliances. In February 1987, it established a 50-50 joint venture with the Lucky-Goldstar Group, called System Technology Management (STM), to provide systems integration, data processing, and communications services to the Group's 20 affiliated firms and other Korean companies.

In September 1987, EDS Communications Corp. and Telefonica (Spain's national telephone, postal, and telecommunications organization) established a joint-venture company to develop, market, sell, and install packet data networks worldwide using Telefonica's packet-switching system.

## 10. SI Capabilities Summary

EDS has a very strong set of capabilities and few weaknesses in the SI arena (See Exhibit EDS-10). It has outstanding information systems operating knowledge in the services industries based on its experience in running data processing installations for a great number of clients in the banking, financial, and insurance industries. It has similar experience with federal and state and local government customers.

EXHIBIT EDS-10

EDS' Competitive Status	
Strengths	Weaknesses
Operational experience	Systems operations/ processing mentality  Limited sales office network
Vertical industry knowledge	
Large experienced skill base	
Understands new technologies	
Alliances	

Based on more recent experience with General Motors, EDS has developed operating experience in virtually all areas of a large manufacturing company, from CIM applications to the consolidation and installation of a worldwide communications network.

These actual operating experiences make EDS uniquely qualified to develop and operate total information solutions. They also provide EDS with a very large and experienced skill base that can address a very broad range of industry applications.

EDS lacks hardware and software products (with the exception of its ownership position in Hitachi, USA), preferring to obtain other vendors' off-the-shelf products through its strong set of alliances. INPUT does not consider this a weakness because of EDS' strong financial resources and buying power.

EDS has a solid understanding of new technologies and integration techniques based on its experience in running 20 or more very large internal data centers and well over 100 customer premises data centers.

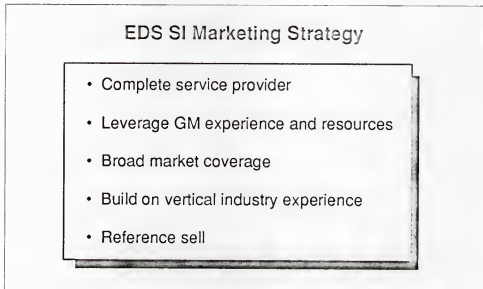
INPUT does not believe that EDS has significant weaknesses. However, its traditional systems operation focus will most likely limit its competitiveness in some systems integration opportunities. Some prospects that are committed to running their own data processing operations will be reluctant to ignore EDS's traditional motivations when an SI solution is proposed. This is justified, since it appears to INPUT that in most cases systems operations is the underlying motivation for EDS's SI activities.

EDS does not have an extensive sales office network, which may prove to be a disadvantage, as it competes with hardware manufacturers that have near-site sales personnel.

### 11. SI Marketing Strategy

Exhibit EDS-11 identifies the key elements in EDS's marketing strategy. The company promotes itself as a systems management firm. It wants to provide total service—from developing an integrated solution, through systems integration, to total systems operations—for the customer.

EXHIBIT EDS-11



INPUT believes EDS will leverage its GM-based buying power with hardware and software vendors and partners (e.g., Hitachi, U.S.A.), as well as the vertical-industry application knowledge it has developed at GM and while operating other installations in other industries.

Finally, a key element of EDS's strategy is to use references from successful systems integration and systems operations contracts to help sell to new clients. The company will use its own data center processing centers to demonstrate its capabilities and will use satisfied customers as references.

In addition, EDS's new organization is focused on broadening its market coverage by establishing organizations responsible for solutions and growth in all vertical markets.

## 12. SI Customer Base

EDS has a broad range of systems operations customers. In many cases the first stage of these contracts requires EDS to develop a total integrated system solution. The majority of its revenue, however, comes from follow-on systems operations activities. The following table, Exhibit EDS-12, identifies representative customers where INPUT believes systems integration is an element of the total systems operation offering. Contract values are not provided, since INPUT believes that the systems operation content would make these values misleading.

EXHIBIT EDS-12

### Examples Of EDS's Customers and Contracts

Company/Industry	Project Description
Champion Sparkplug	Computer-integrated manufacturing
Caterpillar Tractor	Plant automation
Enron Corporation	Companywide systems management
State of Massachusetts	Welfare eligibility
U.S. Army - Project 80X	Personnel management
U.S. Navy - Spar	Global retail inventory and supply system
State of Florida	On-line Human Services delivery system
Bank One	Integrated large commercial banking system

### 13. Summary and Future Directions

EDS's broad range of operational experiences make it a very capable competitor in the SI arena. These strengths include:

- Vertical-industry knowledge of its traditional client base as well as GM-based discrete and process manufacturing, distribution, and aerospace experience
- Operational project development and technology transition management skills, based on actually running GM and EDS data centers and communications networks. This includes the capability to manage very large projects.
- A large, satisfied customer base
- Experience, financial resources, and product-buying leverage provided by its parent, General Motors. This insures its ability to bid very large projects at very competitive prices.
- A focus on total systems management that allows EDS to spread the initial systems integration risk over a longer time period and revenue stream

This last strength, a preoccupation with providing total systems management, may also turn out to be EDS' one major weakness. As a weakness it can:

- Lower EDS's priority on bidding on SI-only projects
- Preclude EDS from serious consideration by the SI customer that wants an integrated solution only, not a systems management contract

INPUT believes that EDS will move even more toward the total systems management concept, deriving its revenues not only from the front-end SI work, but also the follow-on systems operations contracts. The company will be extremely successful in systems management contracts, but less interested and less successful in standalone SI contracts.



## COMPANY PROFILE

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### Grumman Data Systems

#### 1. Key Contacts

Robert J. Myers  
President  
Grumman Data Systems  
1111 Stewart Avenue  
Bethpage, NY 11714-3580  
(516) 575-2335

Daniel G. Terry  
Vice President  
Grumman Data Systems  
6862 Elm Street  
McLean, VA 22101  
(703) 760-0100

#### 2. Background and Current Status

Grumman Data Systems (GDS) provides systems integration (SI) services and support primarily to select customer organizations within the Department of Defense (DoD), the National Aeronautics and Space Administration (NASA), and other federal civil agencies. It also provides these services to state and local governments and provides third-party maintenance to all market segments. GDS has been in the federal systems integration market for six years and has over 450 employees located in McLean, Arlington, and Springfield, VA. Other SI employees are located in facilities in Dayton, OH; Houston, TX; Huntsville, AL; San Diego, CA; Colorado Springs, CO; and Honolulu, HI.

To date, GDS has made no overt attempt to enter or promote itself in the commercial SI market; however, a GDS spokesman indicated that GDS is currently planning to enter that market in the 1991 time frame.

#### 3. Organization and Market Participation

Grumman Data Systems Corporation is a subsidiary of the Grumman Corporation of Bethpage, Long Island, NY and, as such, furnishes all internal systems integration and information processing resources for the corporation and all divisions. The Grumman Corporation operates both domestically and internationally.

GDS presently employs some 1,800 professional systems engineers, computer programmers, analysts, communication specialists, and management and support personnel who are dedicated to or available for assignment to systems integration projects. GDS has an established track record in the federal market. Details are presented in Exhibit GDS-1.

## EXHIBIT GDS-1

**Parameters of Grumman's SI Business**

Full-time federal SI staff	820
Additional SI skilled personnel	880
Projects started or completed since 1987	12
1989 revenues from systems integration	\$187M

GDS is a matrix management corporation. Strategic and long-range planning for participation in the SI market is centralized at the Grumman Data Systems headquarters in Bethpage, NY. The company's program and engineering management and contract review functions are also centralized responsibilities of GDS. Marketing and other aspects of the company are managed on a decentralized basis.

GDS presently dedicates about 40% of its resources to external SI ongoing programs and 40% to internal Grumman Corporation accounts. The remaining 20% is divided among management, marketing, legal/administrative, IR&D, and system development functions. GDS is committed to maintaining state-of-the-art technology and employing an experienced workforce to address the entire range of systems integration services.

**4. SI Capabilities Summary**

GDS is a hardware-independent systems integrator offering the full range of expertise and skills required to deliver a complete information system to fulfill specific customer, operational, and management requirements. A summary of GDS' SI capabilities is provided in Exhibit GDS-2. In the federal market, GDS offers SI system services and support in three application areas:

- Automatic data processing (ADP) and computing systems
- DoD logistics and industrial modernization systems
- Command, control, communications and intelligence systems

GDS has significant expertise in designing customized solutions for large-scale supercomputer systems. To date, it has designed and installed three CRAY and two IBM large-scale scalar-vector processing systems for DoD and NASA customers. Other specific skills include image processing, simulation, mathematical modeling, advanced LAN networking, and intelligent workstations.

## EXHIBIT GDS-2

**Summary of Grumman's SI Capabilities**

1. Proven capabilities in federal systems integration
2. Specialized capabilities
  - Large-scale supercomputer applications
  - Integrated logistics systems
  - Electronic publishing and text management
3. Worldwide multivendor maintenance services

GDS experience and expertise—gained over the past thirty years designing and developing information processing systems for Grumman—gives it a leading position in the defense logistic modernization market. Its expertise includes production and maintenance management, scheduling, manufacturing resource planning, overhaul/repair management, decision support systems, networking, and telecommunications.

GDS also has considerable experience in the design, development, and installation of turnkey hardware and software systems. Other experience includes facility management, training, multivendor third-party maintenance, and information conversion.

**5. Marketing Strategy and Approach**

GDS marketing uses a focused approach to the federal government market. It does not try to be all things to all people; rather, it concentrates its marketing efforts on customer organizations where Grumman has established a reputation either through present or past contracts or through previous concentrated marketing efforts. It normally pursues SI programs in the \$100 million-plus category. Smaller efforts are usually made as a team member or subcontractor. Expansion of existing contracts is also a major marketing endeavor. In 1990, more emphasis will be put on marketing systems integration and professional services in the federal civil agency market. Expansion of GDS' activities in the upgrade and replacement of multivendor hardware, software, and third-party maintenance can be expected in both the federal and commercial markets.

GDS considers Electronic Data Systems Corporation, Computer Sciences Corporation, Planning Research Corporation, Science Applications International Corporation, Boeing Computer Services, TRW, Inc., and Lockheed major professional services competitors, and IBM, Amdahl

Corporation, Unisys, and Digital Equipment Corporation major hardware competitors. A GDS spokesman stated, however, that those listed as competitors today could well be teaming partners tomorrow.

Although GDS, as a hardware independent SI contractor, does not form long-term alliances with particular hardware vendors, its success to date has been based on its use of CRAY, IBM and DEC equipment. GDS continues open dialogue with all major hardware vendors and obtains agreements on a program-by-program basis, based upon its assessment of customer requirements.

#### **a. Positioning and Promotion**

GDS has positioned itself as a major SI contractor for the federal government. GDS brings its customers specialized experience and capabilities it has developed internally for the Grumman Corporation and from previous government programs.

GDS promotes itself through national advertising in trade publications and through professional/technical trade shows. However, like most other industry participants, GDS relies on customer referrals and industry word of mouth as a more effective means of identifying and capturing new business.

#### **b. Customer Base/Specific Projects**

GDS identified several systems integration projects recently undertaken. These projects include:

Air Force—Depot Maintenance Management Information System (DMMIS)

Air Force—Headquarters System Replacement Program (HSRP)

SPAWAR/USMC—Automated Tactical Air Command Center (ATACC)

NASA/JSC—Supercomputer System (SCS)

BDM/Army—Phase I Computer-Aided Logistics System (CALS)

These examples reflect the diversity of technology that GDS employs, and its experience in the federal government market.

#### **6. Summary and Future Direction**

INPUT's impression of Grumman Data Corporation's strengths and weaknesses as an SI vendor is presented in Exhibit GDS-3. GDS has demonstrated that it has the financial and technical resources to be a

strong competitor in the federal SI market and could transfer those resources to the commercial marketplace, particularly if it focuses on using existing specialized capabilities.

## EXHIBIT GDS-3

**Grumman's SI Strengths and Weaknesses**

Strengths	Weaknesses
Defense agency experience	Limited civilian agency experience
Specialized technical & application expertise	Commercial experience limited to state and local government
Project management capabilities	
Financial strength/reputation	

A problem GDS may face as it moves into the federal civil agency SI market is its background and reputation as a defense and aerospace contractor. GDS may also have some difficulty adapting to commercial market contracting practices.

Since GDS relies on solicitation for most of its SI business, it will become increasingly important that it develop a strong marketing and sales strategy for the federal civil agencies and commercial markets.



## COMPANY PROFILE

### International Business Machines (IBM)

#### 1. Key SI Contacts

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General Manager, Application Solution  
U.S. Marketing & Services Group  
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Gerald W. Ebker (Federal SI)  
President, IBM Federal Sector Division  
U.S. Marketing & Services Group  
6600 Rockledge Drive  
Bethesda, MD 20817

Gale Fitzgerald  
Vice President, Professional Services  
IBM Corporation  
472 Wheelers Farm Road  
Milford, CT 06460

#### 2. Description of Principal Business

IBM is the world's largest vendor of computer hardware and related software and services. The company has traditionally been known more for its marketing strength and customer support than technical leadership. IBM has the broadest product line of any supplier and serves virtually all vertical markets. IBM's 1990 worldwide revenues and after-tax profits were \$69 billion and \$6 billion, respectively.

#### 3. IBM Competitive Position

IBM has the broadest set of competitive capabilities in the market. It controls over 50% of the domestic computer market (70% for mainframes) and has an enormous worldwide installed base. The company is able to apply substantial resources to priority efforts such as hardware and software products, customer solutions, and systems integration. In addition, IBM has on-site presence in most of its major customers' data centers.

To overcome its growth difficulties of the past few years, IBM has taken a series of actions to reduce cost and expenses, to streamline its structure, and to sharpen its worldwide competitiveness. It has consolidated manufacturing capacity and operates with fewer layers of management. The number of overhead and indirect positions has been reduced by 50,000, while maintaining the company's tradition of full employment. It has

accomplished this by offering a number of financial incentives and early retirement plans. It has increased by 23% the number of people working directly with customers. To function better in a marketplace that is increasingly more interested in buying integrated system solutions rather than specific products for specific tasks, IBM organized its Applications Solutions (AS) line of business in 1988. Since the inception of AS, IBM has worked hard to convert a marketing organization that is product-sales oriented to one that is focused on providing solutions to its customers. Systems integration has become a major vehicle AS has used to design and implement industry-specific solutions.

#### **4. Markets Served**

IBM's Federal Sector organization, which has undergone a series of name changes during the past five years, has participated in the SI business for 35 years. IBM's commercial marketing strategy has been to provide hardware and software products to all vertical markets. Over the last few years it has offered systems integration services to its commercial customers through a changing and evolving information services organization. These services are available to all vertical industry markets.

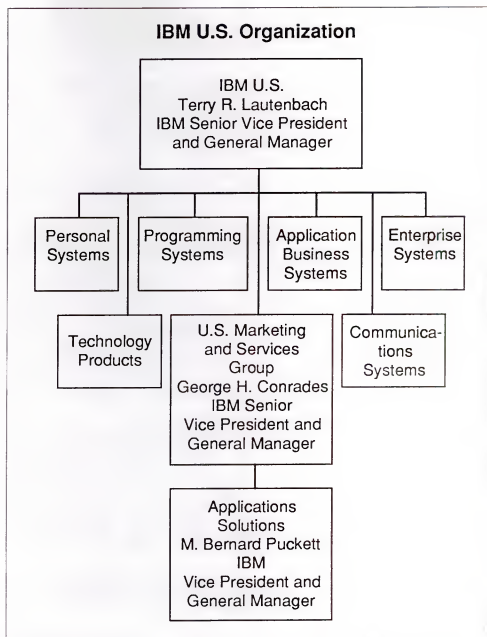
#### **5. Recent Events**

In the mid-1980s, IBM reorganized in an attempt to become less bureaucratic and more responsive. The three major geographic organizations—IBM/U.S., IBM Europe/Middle East/Africa (E/ME/A), and IBM Asia Pacific Group (APG)—were given more autonomy and decision-making authority, previously reserved for the corporate office. IBM/U.S. retained worldwide product development leadership responsibility through its six product and technology lines of business. Exhibit IBM-1 illustrates the IBM/U.S. organization that consists of the six lines of business and IBM/U.S. Marketing and Services.

In early 1988, IBM/U.S. formed U.S. Marketing and Services which includes two key SI organizations, Applications Solutions (AS) line of business and Field Operations, with its eight sales areas throughout the U.S. AS is dedicated to identifying and developing total application solutions to satisfy both vertical industry and cross-industry requirements worldwide. These solutions include SI and applications software products, as well as IBM's more traditional hardware and systems software product offerings. IBM's strategy seems to be focused on strengthening its basic information processing business by providing a complete set of application solutions to meet all requirements. SI is key to this strategy.



EXHIBIT IBM-1



During 1990, IBM moved some of its commercial systems integration resources and responsibility for commercial SI from its centralized Systems Integration Division (SID) to its field marketing organization. SI implementation resources are now distributed throughout the field organizations and report to field sales management. Some of the development organizations formerly in SID have been reassigned to sector divisions. The remainder of SID has been renamed the Federal Section Division and is responsible for all marketing and services provided to the federal government, including all defense and civil agency business.

IBM continues to develop strategic alliances across a broad range of technologies, services, and vertical markets and to make new product hardware and software announcements. During the last two years, IBM has established equity positions in a number of software suppliers that provide applications packages that fit into IBM's solution strategy.

In early 1991, Bernard Puckett replaced Ned Lautenbach as General Manager of IBM's Applications Solutions line of business.

In early 1991, IBM established the Information Systems Services Division (ISSD), which offers systems operations services to IBM's customers. ISSD is headed by Dennie Welsh, former Vice President of IBM's Federal Sector Division.

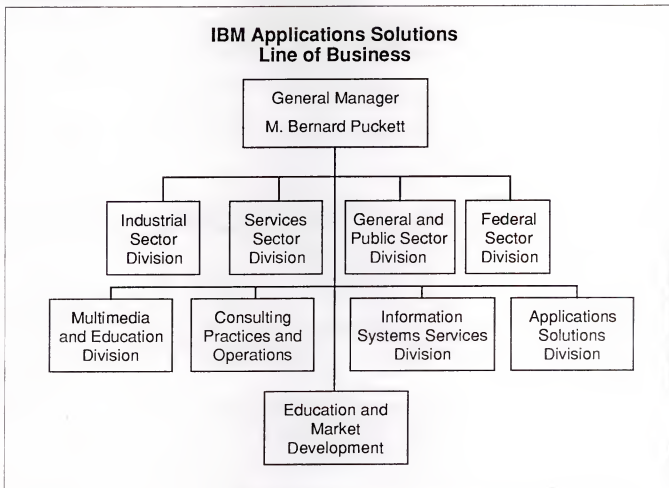
In February 1991, Robert M. Howe was named General Manager, Consulting Practices and Operations, reporting to Bernard Puckett. Mr. Howe joined IBM from Booz, Allen & Hamilton where he was senior vice president responsible for the financial services practice. This event is of importance because it addresses an area—business consulting—where IBM has been considered weak. It is unusual for IBM to go outside to fill a key executive position, which re-emphasizes the importance of business consulting to IBM's total solution strategy.

## 6. SI Organization

Applications Solutions (AS) is the focal point for providing total solutions and systems integration services within IBM. When originally established in early 1988, it brought together the ISG Industry Marketing organization, the Federal Systems Division, the IBM Information Network, the Systems Integration and Professional Services business unit, and the Applications Software Division. (The IBM Information Network was moved from AS in early 1989.)

Since its inception, IBM has continued to adjust AS to increase its focus on identifying, developing, and providing total application solutions. The Industry Marketing organization, now strengthened, has become the cornerstone of this strategy. When AS was formed, a single assistant general manager was responsible for industry marketing support and vertical and cross-industry solutions identification and development. Today, there are five IBM vice presidents and general managers, each focused on a set of industries or sectors. The five sectors are industrial, services, general and public, federal, and multimedia and education. Each sector's general manager focuses on the applications solutions required by the industries within his or her sector, and provides industry consulting to the field marketing organization and its customers. The current AS organization is shown in Exhibit IBM-2.

## EXHIBIT IBM-2



The sectors were strengthened by adding industry- or sector-unique capabilities that were formerly in other IBM organizations. For example, functions from the Charlotte Laboratory and consumer terminal development and manufacturing areas, formerly in the Information Products Division, were added to the services sector, and parts of the Endicott Lab and Application Software Division CIM products organization folded into the Industrial Sector Organization.

There are two other division in AS providing information services to IBM's clients. They are the Applications Solutions Division, which develops cross-industry software, and the Information Systems Services Division, which provides systems operations services.

Two other key executives reporting to Bernard Puckett are the General Manager of Consulting Practices and Operations and the Assistant General Manager for Education and Market Development. The former has responsibility for the excellence of IBM's professional services resources, as well as the development of AD/Cycle.

An extremely important observation needs to be made at this point. IBM, traditionally driven by its product divisions, has recognized the need to be solutions driven. The sector general managers, described above, are IBM vice presidents, similar to the product division presidents. IBM clearly wants to make itself more market driven. By making the solution identifiers/developers and equipment developers equals, IBM hopes to break its traditional product-driven orientation.

INPUT estimates that IBM has about 8,500 employees performing systems integration work. These resources are split between federal and commercial work, as shown in Exhibit IBM-3.

EXHIBIT IBM-3

### IBM Staffing for the SI Business

Market	Staff
Federal	6,000
Commercial	2,500

IBM's SI responsibilities are distributed as shown in Exhibit IBM-4. As a result of the change in organization described earlier, most of the commercial responsibilities have been decentralized. Federal responsibilities are controlled centrally, as is the case with most federal SI vendors.

EXHIBIT IBM-4

### Centralization/Decentralization of SI Business Functions

Responsibilities	Commercial	Federal
Strategy and long-range planning	B	C
Marketing and promotion	D	C
Account management/sales	D	C
Contract review/approval	B	C
Project management/control	D	C
Implementation/development	D	C
Hardware/software acquisition	B	C

C=Centralized, D=Decentralized, B=Both

IBM's marketing strategy is still based on a single IBM customer contact, the field marketing representative, who has customer satisfaction responsibility. This strategy applies to systems integration where the marketing representative identifies the customer need, handles it locally if possible, through the branch, an IBM Marketing Assistance Partner or field professional services resources, or contacts the AS Sector organization for assistance to identify an integrator.

## 7. SI Objectives and Revenues

IBM does not divulge its systems integration revenues. INPUT estimates IBM's total 1990 systems integration revenues at over \$1 billion. This is split between the federal and commercial markets, as shown in Exhibit IBM-5.

EXHIBIT IBM-5

### IBM 1990 Systems Integration Revenues

Market	\$ Millions
Federal	800
Commercial	625

IBM has the longest and most extensive company experience in systems integration. The Federal Systems Division, now Federal Sector Division, has performed large, complex systems integration programs for 35 years. This experience was the foundation for IBM's entry into the commercial SI business.

IBM's past strategy, enabled by its size and ability, was to establish and maintain account control and set standards, causing customers to remain close to the IBM product line. But IBM has not always had the right product at the right time, and often the products provided weren't designed or the software wasn't available to make them work well together. Customers were often frustrated and angered by this approach, and competitors made serious inroads into IBM's customer base. SI is helping to correct this dilemma.

Outside of the federal government, IBM shied away from installing systems that made use of other vendors' products, even though these products filled holes in IBM's product lines. IBM sees SI, both in concept and in implementation, as a means to retain control and develop a stronger software, services, and hardware revenue stream.

SI also gives IBM a vehicle for meeting customers' objections to a single-vendor environment. By offering the products and services of other vendors, as required in some SI projects, IBM expects to regain the account control position it previously enjoyed.

The closeness of the SI vendor to the customer also ensures that IBM's AS organization has a source of market intelligence on emerging requirements. The residual application and industry experience give IBM a strong sense of what the customer wants and needs. The company expects to turn this experience into the vertical and cross-industry products that it can replicate across a broad range of customers. Some products will be off-the-shelf and others will require tailoring and offer the opportunity for SI or professional services implementation revenues as well. This strategy could also result in IBM becoming a much larger player in the turnkey market, where it enjoys limited participation today.

## 8. Internal SI Capabilities Evaluation

INPUT has examined and evaluated IBM's SI capabilities, as described below.

- Business Consulting - IBM's consulting capability is strongest in technology areas and weaker in vertical industry applications. The company is making a conscious effort to strengthen the latter by hiring professionals with experience who add business consulting capability in vertical industry markets. As noted in Section 5, Recent Events, IBM recently hired an experienced business consulting professional, Robert M. Howe from Booz, Allen & Hamilton, as General Manager, Consulting Practices and Operations. One disadvantage IBM has as a consultant is its perceived lack of solution objectivity, and this is most likely true.
- Design Methodology - IBM has not had a unique design methodology for systems integration. In the federal market, IBM has a limited group of highly skilled systems architects who work on SI designs. On the commercial side, IBM has decentralized resources that generally focus on relatively small projects and have used a variety of locally selected products.

INPUT believes that in the future, as AD/Cycle and Repository are completed, they will become IBM's SI design and implementation vehicle. They will allow IBM, which has an expensive overhead structure, to become much more competitive by providing a front-end methodology for capturing business requirements and creating custom software.

- Design and Integration - IBM's federal organization developed effective software, systems engineering, and integration and test skills and practices to address federal contracts. During the late 1980s, when both federal and commercial resources were included in the Systems Integration Divisions, many of these disciplines were transferred to the commercial professional services and SI organization. Once again, AD/Cycle and Repository will be key in this area.
- Project Management - IBM's significant experience in very large federal SI projects caused it to develop a strong set of program management practices. These practices are well documented and have been transferred through education programs to IBM's commercial and non-U.S. SI personnel. IBM will most likely rely on its Federal Sector Division for program management skills for very large commercial projects, and its field professional services organization to manage smaller ones.
- Software Development - IBM has a great deal of experience developing complex systems software. It has less experience in applications software. Its application solutions strategy is based on a variety of applications packages, many developed by equity partners, that IBM will tailor to meet its clients' needs. When a great deal of custom software development is required, IBM currently looks to subcontractors who generally have a lower cost structure than IBM. As AD/Cycle becomes available, INPUT expects IBM will use its own personnel more for developing custom software.
- Education, Training and Documentation - IBM has extensive and highly respected capabilities in the area of technical training, resulting from its need to train its customers on its products. IBM offers education across the broadest range of topics and provides the greatest geographic coverage of any vendor. IBM has also applied advanced technology, such as satellite communications, to provide quality cost-effective education.
- Packaged Application Software - While IBM has developed packaged application software, few of its internally developed products have gained wide acceptance. Under its application solutions strategy, it has identified industry-specific applications architectures and identified software vendors that can supply components that IBM does not have. In some cases IBM has taken equity positions in firms that have existing application packages or the industry knowledge and skills to assist IBM in building its own.

- **Packaged Systems Software** - Systems software is one of IBM's major strengths. There are few practical alternatives to the industry standards IBM has established in the mainframe area with MVS, CICS, IMS, and DB2. IBM offers effective systems software programs on its smaller systems; however, it still needs to solve all of the interoperability and connectivity issues among minicomputers, microcomputers, and mainframes. It is solving this problem through Systems Applications Architecture (SAA) and is beginning to support open systems architecture.
- **Standard Computer Hardware** - Computer hardware is another major area of IBM strength. IBM is the world leader in terms of the breadth and depth of its product line. This advantage has, at times, slipped away, as highly focused companies such as Apple, SUN, and Tandem produced superior products. While IBM's hardware offerings have, in the past, suffered from lack of compatibility and poor connectivity, IBM's new families of products—PS/2, AS/400, System/390 and SAA—have placed IBM in a strong competitive position.

IBM will almost always bid its own hardware. The exceptions to this are limited to areas where IBM lacks specialized hardware components, where IBM does not have a product, where its product does not meet specifications, or where the customer has specified another vendor's equipment.

IBM also has a complimentary products organization that negotiates with other computer industry vendors to add non-IBM products to the IBM sales manual. This is used in cases where IBM does not have a product that is required by the IBM customer set. These products can carry either the IBM or other vendor's logo.

- **Custom Computer Hardware** - IBM also has a custom hardware development organization. It develops products to satisfy weaknesses in the product line. These products usually are industry-unique terminals and terminal modifications, and the systems and applications software modifications required to include them in an IBM systems solution.
- **Communications Hardware** - IBM offers a limited series of communications controllers, modems, multiplexers, and diagnostic units. Through Rolm, it gained a set of superior telephony products, although it has sold the development and manufacturing of these products to Siemens.
- **Network Management and Operations** - Over the course of the last two years, IBM has entered the systems operations business in a big way. In 1991 it announced the Information Systems Services Division, which focuses on outsourcing of systems and network operations.



- **Service and Repair** - IBM possesses outstanding internal strengths in service and repair. Capabilities include wide geographic coverage, an efficient parts distribution and support network, second- and third-level support personnel in branches, remote diagnostic centers, and a problem/solution/fix status data base called RETAIN. IBM will support other vendors' products as well as its own.
- **Software Maintenance** - IBM has an outstanding software maintenance capability that contains most of the same support elements as hardware support, described above.

### 9. SI Strategic Alliances

IBM has hundreds of alliances with marketing assistance partners (MAPs), system integrators, and other partners. In the commercial SI arena, IBM has established strong relationships with a number of integrators since 1986. IBM, in most cases, acts as prime contractor and supplies the hardware. The partners act as subcontractors and provide much of the professional services content of the project. These subcontractors are identified by the field organization or the different industry marketing organizations within the sectors. Selection is usually based on industry knowledge, application expertise, end-user relationships, technical skills, and SI experience. SI partners value this arrangement, since it exposes them to IBM's new technology and provides them with the lowest possible IBM product prices for the bid. IBM has formed alliances with integrators from the Big 6 accounting firms, the RBOCs, professional services companies, and aerospace companies. A representative sample of IBM's SI teammates is listed in Exhibit IBM-6.

EXHIBIT IBM-6

#### IBM Strategic Partners in Systems Integration

- American Management Systems (AMS)
- Electronic Data Systems (EDS)
- Andersen Consulting
- Coopers & Lybrand
- Computer Sciences Corporation (CSC)
- Computer Task Group (CTG)
- SHL Systemhouse
- Policy Management Systems
- Martin Marietta Data Systems

## 10. SI Capabilities Summary

IBM has skills in all of INPUT's 14 capabilities categories. Some are strong, such as the broad and strong product line, while others, such as business consulting, are weaker.

The company has excellent technical skills, the broadest geographic coverage of any vendor, a strong federal SI background, and a full range of alliances with excellent teammates and subcontractors.

Over the last two years IBM has made significant strides to improve its vertical industry capabilities. Through a worldwide applications solution focus, it is developing templates for vertical industry application requirements. These templates will ultimately become input to IBM's AD/Cycle products and permit IBM to tailor customer-unique solutions very competitively.

Exhibit IBM-7 summarizes INPUT's assessment of IBM's SI capabilities. The weaknesses listed are clearly being addressed by IBM. If its AD/Cycle strategy is on schedule and successful, many of the weaknesses will become strengths.

EXHIBIT IBM-7

### INPUT's Evaluation of IBM's Capabilities

Strengths	Weaknesses
Hardware and systems software products	Solution consulting objectivity
In-house technical skills	Business consulting skills
Geographic coverage	Vertical market solutions
Federal experience	
Alliances and equity positions	

## 11. SI Marketing Strategy

### a. Customer Benefits Promoted

IBM sells its prospective clients the following benefits: avoiding hiring peaks and the need for advanced technology skills for large projects, gaining the latest state-of-the-art technology, increased probability of project success, return on investment, and predetermined cost and schedule.

### b. Application Targets

As indicated in the earlier discussion on IBM's worldwide application solutions organization, IBM is trying to provide solutions for all vertical industries as well as cross-industry applications. Its strategy is to team with software developers and integrators that have known capability in the different vertical markets while building its own application knowledge and software portfolio. IBM's equity investment in key software developers also supports this objective.

### c. Industry Targets

As indicated earlier, IBM's strategy will affect most industries as it strives to satisfy the broadest of customer bases.

### d. Promotional Strategy

IBM advertises its SI capabilities in trade or industry publications, but relies more on word-of-mouth and client referrals to promote its SI business.

## 12. SI Customer Base

IBM did not disclose the number of SI contracts it is engaged in or has completed. INPUT believes that IBM has been involved in hundreds of SI projects with prices that range from less than \$100,000 to several hundred million dollars. On the federal side, they have been awarded the \$3.5 billion dollar FAA Advanced Automation contract. While IBM did not disclose its customers to INPUT, some programs it has won are identified in Exhibit IBM-8.

EXHIBIT IBM-8

### IBM SI Project Examples

Company	SI Project
AMADEUS	Airlines reservation system
Ford Motor Company	Plant automation-truck instrument panels/office automation
Internal Revenue Service	Tax collection system
NC Board of Education	Administrative network
Lincoln National Corp.	Imaging system
Resolution Trust	Tracking system
USAA Insurance Co.	Image-based folder management system

### 13. Summary SI Evaluation

#### a. Capabilities

IBM possesses impressive strengths that cannot be overlooked.

- IBM has an immense customer base from which most SI opportunities will emerge. On a worldwide basis, it includes the largest companies in each industry. IBM is virtually assured to be among the first to know of these opportunities.
- IBM has a virtually unlimited capacity to address mega-opportunities. Smaller companies may be unwilling to assume the risk or be required to sign performance bonds or underwrite risk insurance to compete. IBM is in a position of great financial strength.
- IBM has a strong base of internal systems integration skills.
- IBM's ability to invest in applications solutions is tremendous. The ability to invest in developing replicatable solutions may prove critical in the SI market. IBM has established the organization and resources to accomplish this.
- With its broad and widely accepted product line, large customer base, and immense investments in technology, IBM has the ability to attract a broad range of third parties that are willing to be partners, teammates, and subcontractors. IBM has literally hundreds of these alliances in place today.

#### b. Possible Weaknesses

IBM has several areas of weaknesses, although it is aware of most of its limitations and is taking action to correct them.

- IBM's broad product line, in many areas, suffers from incompatibility and lack of connectivity. This is one of the major reasons that IBM originally established an SI capability and is implementing SAA. Solving this problem will result in a stronger product line but, at the same time, eliminate some of the need for systems integration.
- IBM has traditionally had a very distinct preoccupation with hardware products. While it has become more market driven and is addressing its clients' needs through its Applications Solutions line of business, it has yet to prove that it can successfully bring together SSA, AD/Cycle, and its vertical industry architectural templates.

- The marketing organization must learn and accept a new direction and set of skills. Its traditional orientation emphasizes the sale of products, not solutions. The sales organization is used to immediate results based on product shipments, not long-term returns based on lengthy program development and implementation cycles. IBM has revised its sales incentives to place equal emphasis on services and products, yet it remains to be seen if the sales organization will respond to this change in emphasis.
- It is clear that prospects for SI are looking for industry knowledge and application expertise. IBM, because of its broad customer base, is attempting to develop expertise in all industries. There is still a question whether IBM, regardless of its size and resources, can attract the talent required to achieve this ambitious goal in the near term.
- IBM will most likely never be a price leader in SI. The immense support structure and overhead that it has developed through the years, and is now trying to reduce, as well as its desire for high margins, will give it less flexibility than many of its competitors.

#### 14. Future IBM Directions in SI

IBM has clearly recognized the need to be market driven and to develop and market solutions rather than products. This major transition will continue as long as IBM sees this as the only option in maintaining its market position. While some aspects of this strategy may change, the thrust is expected to continue.

IBM will continue to focus on developing replicatable solutions to leverage its development investment and reduce the skill requirements and risks associated with one-of-a-kind SI engagements. INPUT also believes that IBM will continue to focus more on internal training and tools to improve the productivity of its personnel. It will also depend on its AD/Cycle applications development and maintenance strategy to make it much more competitive in the SI and professional services arena.



## COMPANY PROFILE

**KPMG Peat Marwick 1. Key SI Contacts**

Jules Ghedina, Principal  
KPMG Peat Marwick  
3 Chestnut Ridge Road  
Montvale, NJ 07645

**2. Description of Principal Business**

KPMG Peat Marwick (Peat Marwick) is the professional services consulting organization of one of the original "Big 8" accounting and auditing firms. In its management consulting role, Peat Marwick offers systems advice and implementation services in functionally-defined markets ranging from banking and finance to manufacturing and transportation. Its customers include all levels of federal, state, and local governments, and both wholesale/distributor and retail businesses.

KPMG Peat Marwick's systems integration practice includes the Nolan, Norton & Co. unit, which specializes in corporate IT strategy and business transformation planning; Peat Marwick Advanced Technology, which specializes in CASE, re-engineering, telecommunications and data center management services; Runaway Systems Management services, which specializes in salvaging out-of-control SI projects; the Executive Technology Center, which provides services for technology prototyping and solution demonstration; and Strategic Research Services, which provides technology, business, regulation and economic research.

In 1988 and 1989, Peat Marwick's total SI business grew from approximately \$185 million per year to \$220 million per year; it was divided between commercial and federal projects, as shown in Exhibit KPM-1.

**EXHIBIT KPM-1****KPMG Peat Marwick SI Business,  
1988 and 1989**

Market Sector	1988 (\$ M)	1989 (\$ M)
Commercial	110	130
Federal	75	90

Since the beginning of 1988, Peat Marwick has started more than 120 SI contracts, divided between commercial and federal clients in a ratio of 5:1. The company estimates its average contract values are more than \$5 million for commercial contracts and more than \$10 million for federal contracts. In concert with other SI services vendors, Peat Marwick estimates that contract values in both the commercial and federal markets are increasing.

### 3. Competitive Position

As an auditing and management consulting firm, Peat Marwick has had to be able to recognize and rectify business problems in a great variety of business clients. As an SI contractor, Peat Marwick can not only trade on its reputation, but can offer unique products and services to the marketplace, as shown in the sample of its offering presented in Exhibit KPM-2.

### 4. Markets Served

KPMG Peat Marwick projects a commanding presence throughout the business and government marketplaces. INPUT asked the company to identify its primary target markets; KPMG Peat Marwick identified its SI business marketing focus as being in the following vertical markets:

- Banks
- Health care
- Insurance
- Manufacturing/high technology
- Merchandising businesses
- Government (all levels)
- Transportation
- Energy/Utilities

These markets appeal to KPMG Peat Marwick for the following reasons:

- They are characterized by large, complex information technology organizations
- They have a history of consultant use
- They show clear industry trends of growth and complexity
- They often have complex, transaction-based internal operations



## EXHIBIT KPM-2

**KPMG Peat Marwick Technologies and Target Applications**

Peat Marwick Technology	Target Application
CASE/Design Methodology <ul style="list-style-type: none"><li>- Application Engineering Methodology</li><li>- Life Cycle Builder</li></ul>	Application development  System integration
Industry-specific Software <ul style="list-style-type: none"><li>- FAMIS</li><li>- STARS</li></ul>	Federal, state, and local government accounting systems
Connectivity Products <ul style="list-style-type: none"><li>- MacDSS</li></ul>	Macintosh systems integration and decision support/ executive information systems
Project Management Processes	Runaway Systems Management Methodology
Data Management Products	Data Tec: bottom-up data name rationalization
Network Management Products	FIRMNET network design methodology
Strategic Systems Planning Processes	Methodology for linking business strategy to IT investments

**5. Recent Events**

Consistent with its background in accounting/auditing and management consulting, Peat Marwick is reluctant to disclose its work for clients, unless such activities are made public by the clients themselves.

## 6. SI Organization

Peat Marwick is a client-oriented organization. As such, nearly all functions of a Peat Marwick office are decentralized; excepted are the steering functions of long-range strategy and planning, and overall marketing and promotion, as shown in Exhibit KPM-3. The company maintains nearly 1,000 full-time SI-assigned staff, almost two-thirds of whom are assigned to full-time commercial SI activities.

EXHIBIT KPM-3

### KPMG Peat Marwick SI Business Functions: Centralized/Decentralized

Responsibilities	Commercial	Federal
Strategy, long-range planning	B	B
Marketing & promotion	B	B
Account management, sales	D	B
Contract review & approval	D	B
Project management & control	D	D
Implementation & development	D	D
Hardware/software acquisition	D	D
Systems operations	D	D

(D = Decentralized, B = Both centralized and decentralized)

Peat Marwick's commercial and federal SI business operations both report to the national Partner-in-Charge of Management Consulting.

Peat Marwick, being a technical management specialist firm, devotes relatively less staff to implementation and more staff to management and management support, as shown in Exhibit KPM-4.

## 7. SI Business Objectives

Peat Marwick must live or die based on the strength of its reputation and its unique service and product offerings. Peat Marwick pursues its SI client business by focusing on the following:

- Instant value in the service sets
- Being a partner with the client
- Strategies, cost benefits, and fast delivery
- Outstanding project management
- Industry strengths from a consulting viewpoint

- Outstanding technology credentials, vendor alliances, and delivery system

Like many other professional services firms, Peat Marwick does not advertise in the public media—it does, however, use some direct mail. More effective than direct mail are presentations in public seminars and vendor-supported programs. Even more effective is word-of-mouth client referrals, due to the excellent reputations of Peat Marwick and its Nolan, Norton & Co. unit in their fields of endeavor.

## EXHIBIT KPM-4

**Distribution of SI Personnel--KPMG Peat Marwick**

Capability	Percent
Management, strategy & planning	15
Legal support/contract administration	5
Project management	20
Systems development/implementation	25
Hardware/software evaluation/acquisition	15
Hardware engineering	5
Sales	15

**8. SI Capabilities Evaluation**

Peat Marwick has developed a wide range of capabilities in its auditing and management services consulting history, which it can bring to bear on a wide range of client problems. Exhibit KPM-5 summarizes Peat Marwick's assessment of its strength in in-house capabilities and whether it routinely uses alliances to satisfy clients' requirements.

Peat Marwick has significant capability in every area identified in Exhibit KPM-5, except for service and repair. INPUT also notes that this company has alliances in areas where it is fully capable of performing by itself; thus, it strengthens not only its technical capability but its ability to respond more quickly to a client's needs.

INPUT's evaluation of Peat Marwick's capabilities is high. Its strengths include not only a high level of technical and management expertise, but also alliances to fill in or enhance already high levels of expertise and readiness. INPUT believes that Peat Marwick is fully capable in both technical and management areas; in particular, INPUT notes that this company has built a solid reputation in the area of retrieving projects that a company (or a previous contractor) has lost control of (Runaway Systems Management).

## EXHIBIT KPM-5

### KPMG Peat Marwick Assessment of SI Capabilities and Use of Alliances

Capability	Strength (High/Medium/Low)	Alliance (Yes/No)
Strategy Services	High	No
Business Consulting	High	No
Design Methodology	High	No
Design/Integration	High	No
Project Management	High	No
Software Development	High	No
Education/Training/ Documentation	Medium	Yes
Packaged Applications Software	High	Yes
Packaged Systems Software*	High	Yes
Standard Computer Hardware*	High	Yes
Custom Computer Hardware*	Medium	No
Communications Hardware*	High	No
Network Design	High	No
Service and Repair	(No capability)	N/A
Software Maintenance	Medium	No
Information Technology Strategy	High	No

\*Evaluation and Selection Services only

## 9. SI Strategic Alliances

Peat Marwick's strategy is to use alliances selectively to enhance its own capabilities and improve its response times. The company uses both long-term agreements and contract-by-contract arrangements, as follows:

- Long-term agreements are used to develop critical technologies and/or address specific markets
- Contract-by-contract arrangements are used to put together the exact combination of skills, experience and technology needed to provide the client with a total business solution.

Exhibit KPM-6 identifies the salient points of Peat Marwick's alliance strategy. It is clear that, with its strength in management consulting, Peat Marwick views alliances not only as capability enhancements but also as additional resources.

Exhibit KPM-7 identifies some of Peat Marwick's major alliances.

**EXHIBIT KPM-6****KPMG Peat Marwick's Alliance Strategy**

- Offer clients a full range of high-quality SI services
- Joint marketing efforts (seminars, lead sharing, etc.)
- Provide industry- and technology-specific expertise
- Fast delivery of technology needs
- Improve direct access to marketplace

**EXHIBIT KPM-7****KPMG Peat Marwick Strategic Alliances**

Company	Purpose of Alliance
Apple Computer	Decision Support/Executive Information Systems Macintosh connectivity
Businessland	Total solutions in LAN environments Desktop/LAN-to-mainframe integration
ODR, INC.	Organizational change management methodology
XA Systems	Software engineering/CASE tools
Brightbill Roberts	Object-oriented software environment
IBM	AS/400 systems integration
Unisys	Open system architecture, CASE, 4GL tools, image processing, EDI, manufacturing application integration

## 10. SI Capabilities Summary

Peat Marwick has nearly all the SI capabilities required to fully compete in the SI marketplace. Choosing not to offer equipment service and repair, Peat Marwick nevertheless can present itself as a full-service, single-source SI services vendor if it chooses its SI target projects carefully.

Peat Marwick's strengths are in the functional areas of management and control. Thus, rather than trying to meet all the needs of the financial and banking industries, for instance, it has developed augmented capabilities through its alliances in functional areas such as:

- Strategic systems planning
- Decision support/executive information systems
- Organizational change management
- Software engineering and CASE tools
- Minicomputer (AS/400)-based office information systems
- Cooperative processing application environments

Exhibit KPM-8 summarizes Peat Marwick's capabilities.

EXHIBIT KPM-8

### INPUT's Evaluation of Peat Marwick's SI Capabilities

Strengths	Weaknesses
Project management expertise and processes Strong set of tools & methodologies Vertical industry knowledge Connectivity products	Equipment service and repair

## 11. SI Marketing Strategy

Peat Marwick follows a function-oriented marketing strategy that leverages its strengths in technological and management problem areas. (See also Section 4, Markets Served.) This company derives all of its federal SI business from responding to requests for proposals (RFPs). Commercial SI business is gained from RFPs (40%), proactively leveraging existing clients (40%), and direct marketing (20%). Peat Marwick is one of very few companies offering SI services that successfully uses direct mail as a business marketing tool.

- Competitors: Exhibit KPM-9 identifies Peat Marwick's principal competitors in the SI market.

EXHIBIT KPM-9

Peat Marwick's SI Competition	
Commercial	Federal
IBM	CACI
DEC	CSC
EDS	EDS
CSC	
Ernst & Young	
Andersen Consulting	

- Positioning: Peat Marwick presents the same set of capabilities to both commercial and federal clients. Peat Marwick presents its strength as lying in the technical management arena; especially strong is its ability to snatch a project from the brink of death, when it has already gotten out of control, and return it to the client healthy.
- Promotion: Peat Marwick does not advertise in the public or trade media. It uses public seminars and vendor-supported programs to good advantage (Peat Marwick rates the response to these efforts as "medium"). Even more effective is word-of-mouth client referrals (rated "highly effective"). Peat Marwick rates direct mail as relatively ineffective, yet approximately 20% of its commercial SI work results from direct mail marketing.

Exhibit KPM-10 presents a summary of Peat Marwick's marketing approach.

## 12. SI Customer Base

Peat Marwick reports that it gains 60% of its federal SI business from new accounts; 80% of its commercial SI business is derived from new accounts. Both commercial and federal SI undertakings are profitable.

Peat Marwick declined to identify any clients or SI projects, claiming client privilege.

## EXHIBIT KPM-10

**KPMG Peat Marwick's Marketing Strategy**

- Marketing and promotion through both centralized and decentralized units
- Leverage existing commercial clients
- Functional market focus
- Primary competitors: IBM, DEC, EDS, CSC, CACI, Ernst & Young, Andersen Consulting
- Positioning: technical (especially, project) management
- Promotion: Public programs, word-of-mouth

**13. Summary and Future Directions**

Peat Marwick's strengths include its management consulting expertise, its project management skills and experience, especially involving organizational changes, and its software design and development capabilities. In addition, its alliances provide strength in areas where Peat Marwick is weak.

On the negative side, Peat Marwick currently chooses not to offer services in the areas of equipment service and repair.

Peat Marwick declined to disclose any information about its management structure; however, its longevity attests to the effectiveness of its management practices.

Lacking information about Peat Marwick's revenues and organization, INPUT can make only limited comment about Peat Marwick's future. Peat Marwick has, however, revealed that it does have strong abilities in a number of areas. Also, Peat Marwick has developed an effective group of alliances. Clearly, Peat Marwick has been successful at what it chooses to pursue. Peat Marwick appears to have set a viable direction for its SI opportunities. With care in choosing its projects, it should compete very successfully.



## COMPANY PROFILE

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### Litton Computer Services (LCS)

#### 1. Key Contacts

Mr. Ray Wolfe  
VP of IS Business Development  
Litton Computer Services  
4747 Hellyer Ave.  
P.O. Box 210059  
San Jose, CA 95138

#### 2. Background and Current Status

Litton Computer Services (LCS) provides processing services to commercial clients and state and local government, and professional services to the federal government. The company also provides processing services support to its parent company, Litton Industries. LCS was formed in 1973 through the combination of two separate Litton divisions. With 1987 revenues of approximately \$100 million and a staff in excess of 1,000, LCS operates both domestically and abroad.

LCS provides processing services to over 600 customers from its three major data centers in Reston (VA), Lexington (MA), and Woodland Hills (CA). For over two decades LCS has provided continuing support to the U.S. military and space programs in the areas of systems design, development, and software engineering.

Litton has been in the federal systems integration market for approximately 6 years and in the commercial market for just about one year.

#### 3. Organization and Market Participation

As VP of IS Business Development, Ray Wolfe is the primary focus for the development of Litton's Systems Integration business. Much like EDS, Litton applies resources from throughout the corporation for the implementation of SI projects; consequently, at present Litton has no centralized or dedicated organization for SI. Since Litton focuses on large projects, the number of professional personnel dedicated to SI efforts can vary significantly. Currently there are about 150 people actively involved in SI projects, but the number has been as high as 300.

Exhibit LCS-1 summarizes the key parameters of Litton's SI business.

Litton would not disclose its annualized revenue from systems integration efforts, but INPUT estimates that the proportion has been approximately 70% of annual noncaptive professional services revenue, or approximately \$25-30 million. Litton's forecast of growth for this revenue stream is about 15%.

## EXHIBIT LCS-1

**Parameters Of Litton's  
SI Business**

Parameter	Value
Average staff involved in SI contracts	150
Projects started or completed since 1987	3
Annual revenues from systems integration*	\$30M

\*INPUT's Estimate

**4. SI Capabilities Summary**

As shown in Exhibit LCS-2, LCS's primary capabilities at present are the strengths it has gained as a professional services supplier to defense agencies of the federal government. In addition, the organization has had considerable experience in the areas of design/integration, program/project management, and custom software development. Other capabilities include:

## EXHIBIT LCS-2

**Summary Of Litton's  
SI Capabilities**

1. Federal government/defense contract experience
2. Network design, implementation, and management skills
3. Implementation experience on various hardware environments
4. Industry-specific software—finance/manufacturing

- Network design, implementation, and management skills developed as a result of years of experience in processing services
- A broad range of in-house expertise in the utilization of a variety of standard and customized hardware environments gained through LCS's work with other contractors and alliances on specialized defense contracts
- Industry-specific software and experience in the manufacturing, retail, finance, and insurance vertical sectors

## 5. Marketing Strategy & Approach

The primary motivator for Litton's participation in the SI market is the potential profit to be gained from the professional services and contract management aspects of SI. With its history and experience in network operations, Litton also sees the potential of long-term systems operations contracts as an incentive to participate in the SI market.

Litton's market orientation is primarily vertical and utilizes the company's traditional lines of business. Primary targets are:

- Government (federal, state and, local)
- Manufacturing
- Retail distribution
- Financial services

Litton believes that it has special expertise in areas that can provide added value to potential customers. LCS currently has a packaged financial management system under development that has evolved from custom work; the company has gained considerable capability in POS from other contract experience.

It is too early to tell who the company's primary competition will turn out to be in the commercial SI marketplace, but Litton did identify IBM, CSC, BCS, EDS, and MMDS as chief competitors in the federal arena.

Although LCS has no formal alliance program, the company does make extensive use of partners/alliances on a contract-by-contract basis. The reasons vary dramatically, but include the need to:

- Supplement professional services staff in a particular geographic location
- Provide hardware and software support

Although LCS has conducted implementations on a wide variety of hardware environments, Tandem appears to be a principal partner in areas where high-volume transaction processing is a key component of the project.

#### **a. Positioning and Promotion**

Litton positions itself as having strength in particular vertical market sectors. In addition it promotes its skills in project management and software development as key reasons why prospects buy. As with most vendors, LCS finds that customer referral and word of mouth are the most effective means of generating new business opportunities. The company also utilizes general trade and industry publications as well as trade shows to communicate its capabilities. However, like most of the competition, Litton's assessment of the effectiveness of these approaches is low.

#### **b. Customer Base/Specific Projects**

Although LCS was not willing to discuss particular projects, INPUT is aware of at least two projects of significance. The first is the U.S. Air Force Reliability and Maintainability Information System (REMIS). This systems integration project will provide the Air Force with the ability to retrieve reliability and maintainability logistics data on a worldwide basis. REMIS will support more than 2,000 users throughout the major commands, air logistics centers, and technology repair centers. The system consists of five geographically distributed Tandem V LX computers and hundreds of terminals. INPUT believes that the value of the project is in excess of \$100 million over a ten-year period. This type of project would be consistent with Litton's stated objectives of participating only at the large-contract end of the spectrum.

In addition, LCS holds an \$85 million contract with the Royal Saudi Air Force whereby Litton has developed an integrated logistics management system.

### **6. Summary and Future Directions**

To date, LCS's experience in SI has been highly specialized and heavily weighted toward the defense arm of the federal government. Although the company claims one major commercial contract, it remains to be seen whether Litton can convert its federal experience into the commercial marketplace. INPUT's view of Litton's strengths and weaknesses are summarized in Exhibit LCS-3.

## EXHIBIT LCS-3

**Litton's Strengths and Weaknesses In SI**

Strengths	Weaknesses
Government experience	Market perception
Program management Skills	Business consulting skills
Network development/management	Lack of commercial experience
Strong resource base	

Litton has a good track record, and certainly possesses the technical skills and financial resources to become a more significant player. INPUT believes that Litton will remain a low-profile and specialized player in the short term and will work in its established areas of expertise on very large projects. Over time, Litton will likely:

- Seek stronger alliances to support its weak spots in the top end of the life cycle
- Place additional emphasis on marketing and sales to increase business volume
- Package and release applications software modules in finance and manufacturing

Without at least the first two, it's unlikely that Litton can become more than a highly specialized competitor in the systems integration marketplace.



## COMPANY PROFILE

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### McDonnell Douglas Systems Integration Company

#### 1. Key SI Contact

Mr. Mark Kuhlmann  
President and General Manager  
McDonnell Douglas Systems Integration Company  
P.O. Box 516, Mail Code 3061121  
St. Louis, MO 63166

#### 2. Description of Principal Business

McDonnell Douglas Systems Integration Company is the remaining U.S.-based information systems business of McDonnell Douglas Corporation. McDonnell Douglas Information Systems Company was officially dissolved January 1, 1990 and several of its diverse units were divested, put up for sale, or are in the process of being spun off. See Exhibit MCD-1.

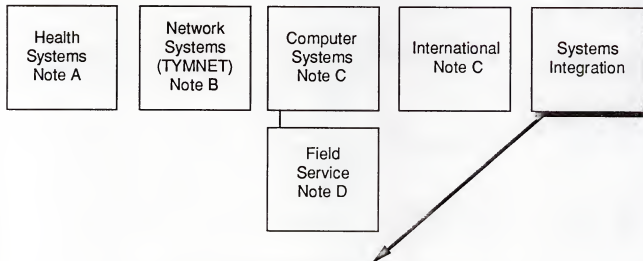
The Systems Integration Company is now a more focused business, primarily offering engineering-based products and services to manufacturing, telecommunications, state and local government, insurance, federal government, computer-aided software engineering, remote computing, and built environment technologies (architects, engineers and constructors, and infrastructure life cycle management).

McDonnell Douglas Information Systems Company at its peak had over \$1 billion in revenues and about 10,000 employees. In 1989, the Systems Integration Company will have revenues of about \$300 million with over 2,000 employees. After having been consistently unprofitable over six years, the Information Systems Company became profitable in the first half of 1989. About 70% of the Systems Integration Company's 1989 revenues are a result of SI activities and are divided between the commercial and federal markets, as shown in Exhibit MCD-2.

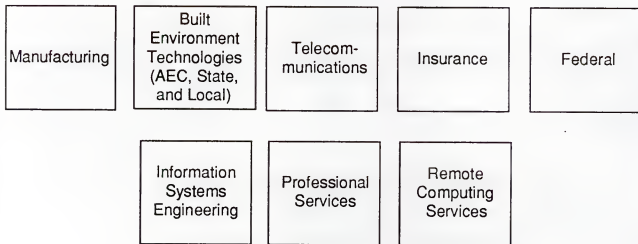
## EXHIBIT MCD-1

**McDonnell Douglas Information Systems Company  
Restructuring**

Information Systems Company  
Beginning of 1989



Systems Integration Company  
Beginning of 1990



- A. Divested to American Express (3/89)
- B. Divested to British Telecom (11/89)
- C. Combined to become a U. K.-based company (7/89)
- D. To be divested



## EXHIBIT MCD-2

**McDonnell Douglas  
Information Systems Company  
1989 Systems Integration Revenues**

Business Component	\$ Millions
Federal	10
Commercial	200

### 3. Competitive Position

The Systems Integration Company's strengths are based on its ability to capitalize on McDonnell Douglas Corporation's skills and experience in engineering and manufacturing, as well as its long-term relationships with a number of key accounts in its chosen markets. The Systems Integration Company should be in a better competitive position now that McDonnell Douglas' information services offerings have been pared down to a more focused set of products and markets.

The restructuring of the Systems Integration Company may cause some uncertainty in the short run, as a direct result of the reorganizations that have given it birth, as well as the necessity that the marketplace understand the capabilities of the new McDonnell Douglas entity.

### 4. Markets Served

The Systems Integration Company serves the following primary markets:

- Discrete manufacturing (with focus on aerospace, automotive)
- The architects, engineers and constructors (AEC) market, and the infrastructure market in state and local government, served by the Built Environment Technologies Division.
- Telecommunications companies
- Insurance companies (primarily automated claims processing for health, property/casualty, and reinsurance)
- Federal government
- System development organizations (for CASE methodology and tools)

- Professional services clients (for contract programming services)
- Remote computing customers (including systems operations)

### 5. Recent Events

By far the most important set of recent events has been the exit of McDonnell Douglas from much of the information services business, as described in Section 2. The result has been a much smaller and more focused organization.

### 6. SI Organization

The McDonnell Douglas Systems Integration Company is organized into vertical and cross-industry profit centers, as shown in Exhibit MCD-3.

EXHIBIT MCD-3

McDonnell Douglas Systems Integration Company Profit Centers	
Vertical Industries	Cross-Industry
<ul style="list-style-type: none"><li>• Manufacturing</li><li>• Telecommunications</li><li>• Insurance</li><li>• Federal</li><li>• Architects, Engineers, and Constructors and State and Local Government Infrastructure Management</li></ul>	<ul style="list-style-type: none"><li>• Information Systems Engineering (CASE)</li><li>• Professional Services</li><li>• Remote Computing Services</li></ul>

The cross-industry units' purpose is to support the vertical market units. However, they also provide direct services to customers:

- *Information Systems Engineering* sells CASE methodologies, tools, and training.
- *Professional Services* supplies contract programming, both through projects of other Systems Integration Company divisions and directly to commercial customers.

- *Remote Computer Services* receives revenue from provides remote application processing or systems operations support, a total information service for recently acquired or divested organizations while they are in transition and often for extended periods.

## 7. SI Business Objectives

The Systems Integration Company's market objective is to identify and satisfy the needs of customers who require complex, often technically-oriented information systems in areas of the company's expertise. The Systems Integration Company's internal objective is to perform these tasks profitably. Profitability is a key objective, given McDonnell Douglas Information Systems' history of losses.

## 8. Internal SI Capabilities Evaluation

### a. Business Consulting

The Systems Integration Company offers specialized technical business consulting as the front-end to its design and implementation tasks, which are the core of its offerings.

### b. Design Methodology, Design and Integration, Project Management, Software Development and Education, Training and Documentation

The Systems Integration Company is very strong in this area because of its STRADIS and ProKit\* WORKBENCH CASE products and related services. These are used to support Systems Integration Company projects and are sold commercially (see Section 6).

### c. Packaged Application Software

The Systems Integration Company offers the highly regarded UNIGRAPHICS family of interactive, three-dimensional CAD/CAM software. Applications include solid modeling, sheet metal fabrication, printed circuit board design, finite element modeling, mechanism linkage design, graphics machining, simulation, robotics, plant communications systems, numerical control tape preparation, and quality assurance.

UNIGRAPHICS runs on DEC, Data General, Hewlett-Packard (HP), Apollo, and SUN platforms.

The Systems Integration Company also offers the Graphics Design System (GDS) family of software that serves as the core of its AEC and infrastructure management systems offerings for state and local governments as well as its network engineering offerings for telecommunications.

**d. Packaged Systems Software**

The Systems Integration Company does not offer systems software as such, outside of its CASE products.

**e. Standard Computer Hardware**

The Systems Integration Company's does not develop or manufacture computer equipment. Its core programs support a range of standard computer hardware like DEC, IBM, and other widely used equipment to satisfy its customers' requirements. UNIGRAPHICS supports most of the popular CAD/CAM platforms for the same reason (see Section 9).

**f. Custom Computer Hardware**

The Systems Integration Company does not provide custom computer hardware.

**g. Network Management and Operations**

The Systems Integration Company has not been active on a large scale in network management and operations since the sale of its TYMNET division. The Systems Integration Company is indirectly involved in networking through its work for telephone companies designing systems to support network engineering.

**h. Service and Repair**

After the sale of its field service business, McDonnell Douglas will rely on continuing relationships and alliances for support in this area.

**i. Software Maintenance**

The Systems Integration Company maintains its own software products and offers maintenance of its customized offerings.

**9. SI Strategic Alliances**

The Systems Integration Company has long-term marketing arrangements with most major hardware vendors (e.g., DEC, IBM, HP/Apollo, SUN), as well as selected software vendors of generalized products, such as ORACLE. The Systems Integration Company will team on bids with hardware vendors, accounting firms, and other systems integrators when required. The Systems Integration Company will subcontract where specialized skills are required. Since 1988, the Systems Integration Company has been a preferred vendor of General Motors/EDS, working to standardize CAD/CAM systems within GM.

## 10. SI Systems Capabilities

The Systems Integration Company's core strength is its ability to develop engineering-rich, complex systems. Examples of its capabilities include:

- The UNIGRAPHICS advanced CAD/CAM product
- GDS, the Systems Integration Company's base product for managing physical infrastructure (including geographic information systems)
- The STRADIS and ProKit\* WORKBENCH family of CASE methodology and tools
- Insurance core applications in automated claims handling and reinsurance
- Telecommunications core applications in network engineering and asset management, customer services/network operations, and administrative information systems

## 11. Marketing Strategy

The Systems Integration Company's emerging strategy is to tailor solutions for targeted niches in partnership with clients to whom it can bring proven core products and business understanding. Target niches include:

- Manufacturing companies
- AEC and public sector units with infrastructure (GIS) systems needs (e.g., transportation and environmental agencies)
- Telephone companies
- Insurance companies
- Federal customers

## 12. SI Customer Base

The Systems Integration Company serves over 2,000 customers with its products and services. Specific SI projects undertaken since the beginning of 1988 include three for the federal government and about 15 for nonfederal customers. Typical federal projects range from \$5-10 million.

Exhibit MCD-4 shows selected recent SI projects undertaken by the Systems Integration Company.

EXHIBIT MCD-4

### **Representative McDonnell Douglas Systems Integration Company Projects**

- Telecommunications Engineering and Asset Management System
  - Pacific Telesis
  - Southwestern Bell
- CAD/CAM integration with manufacturing systems
  - Kodak
- Outside Plant Records Integration
  - Bell Atlantic
- Central Artery Project—Highway/Tunnel Alignment Engineering Design
  - Massachusetts Department of Public Works
- Waste Water Treatment Facility for Boston Harbor
  - Massachusetts Water Resources Authority
- Program Administration and Execution System (PAX)
  - U.S. Army Corps of Engineers
- State Environment Agency Office Integration
  - Commonwealth of Massachusetts

### **13. Summary and Future Direction**

The Systems Integration Company is, in a sense, a return to McDonnell Douglas' roots. INPUT expects that the Systems Integration Company will become even more focused as it builds expertise and visibility in a series of subniches, and should be an increasingly formidable competitor in its areas of focus in the future.

## COMPANY PROFILE

NCR

### 1. Key SI Contacts

Paul H. Thurman  
Assistant Vice President  
Customer Services Division  
Systems Integration and Support  
1334 South Patterson Boulevard, USG-2  
Dayton, OH 45479

### 2. Description of Principal Business

NCR Corporation and its subsidiaries develop, manufacture, market, install, and service business information processing systems for world-wide markets. NCR is the best-known supplier of accounting and computing equipment to banks and financial organizations. NCR offers a wide range of equipment—from check sorters to computer mainframes and related banking industry software. NCR also has had a long and strong relationship with the retail distribution industry, where it is well known for point-of-sale and merchandising systems.

As a new entrant into the SI marketplace, NCR is reluctant to disclose any data on its SI revenues.

### 3. Competitive Position

NCR, in its role as a proprietary equipment and software vendor, has been selling solutions to business organizations for many years. NCR's Systems Integration and Support unit, however, has been in the commercial SI business for only three years; it has been active in the federal SI market for only one year. As a customer-oriented company offering total solutions and vertical-industry expertise to its customers, the shift to SI services is a natural response to a changing market.

NCR brings to its SI business time-tested expertise in its vertical markets. In addition, it has adopted the following strategy for promoting its new open systems/interconnectivity stance:

- Use of CASE/design methodology as a systems engineering discipline in applications development
- Promotion and use of industry standards in the development of industry-specific software
- Promotion of cooperative processes in the distributed/multiuser processing environment

- Adopting UNIX and DOS environment standards using IBM microchannel work platforms
- Promoting the use of NCR corporate project management capabilities
- Promoting the use of network management products such as ONE and Network Manager

By the above strategy, NCR positions itself as an integrator of disparate systems in all types of projects.

One weakness that NCR may have is that customers may perceive a lack of expertise outside of the financial and retail vertical industries. A few well-chosen successes that clearly show NCR's mastery of the technologies involved above should quickly dispel any doubts about NCR's capabilities.

#### 4. Markets Served

NCR's SI efforts are aimed primarily at the federal, state, and local governments, and at the following vertical markets:

- Retail
- Financial
- Manufacturing
- Health

NCR currently markets its SI services primarily to industry-focused (i.e., vertical market) clients.

As an equipment manufacturer, NCR formerly marketed its own brand of equipment as the most desirable solution to a client's needs; NCR, however, now presents itself as an open systems solutions vendor, specializing in the integration of systems that operate in multivendor environments. Thus, in its SI pursuits, NCR has become a total service provider.

NCR selects its market targets using the following criteria:

- Value of project
- Strategic direction
- Account control
- NCR's expertise in required area(s)



## 5. Recent Events

NCR Corporation has traditionally focused its efforts in the finance and retail industries; these industries have historically been very discreet about pursuing consulting assistance. Also, NCR, as an SI services vendor, has a very short and unpublicized history. INPUT has no specific examples of NCR's success as an SI services vendor.

Recent reports in the public press have suggested that NCR and AT&T may be pursuing some form of alliance, ranging from outright acquisition by AT&T to a joint marketing arrangement. (AT&T has offered to acquire NCR for \$6 billion.) At this time, it is not clear what will result. What is clear, however, is that NCR's customer base and services strengths coupled with AT&T's telecommunications/network expertise and financial strength would result in a major contender. It should be noted that NCR and AT&T are both committed to open/portable systems and that both companies have something to give and something to gain from any joint working arrangement.

## 6. SI Organization

NCR's Systems Integration and Support organization is an independent division of NCR. Like most SI organizations, NCR uses a matrixed management style that permits some facets of its management to be centrally controlled and other facets to be locally (i.e., decentralized) controlled. Exhibit NCR-1 shows how NCR makes use of centralized/decentralized management in the listed areas.

EXHIBIT NCR-1

### Centralized versus Decentralized Management

Responsibilities	Commercial	Federal
Strategy and long-range planning	C	C
Marketing and promotion	C	C
Account management/sales	D	D
Contract review/approval	C	C
Project management/control	D	D
Implementation/development	D	D
Hardware/software acquisition	C	C

(C = Centralized, D = Decentralized)

NCR admits to about ten times more core staff (90) in its commercial SI efforts than in its federal SI efforts (10). In addition, it uses its field organization to supplement its core staff.

NCR chose not to disclose any detailed information about its SI organization, except for noting that Paul Thurman (head of Systems Integration and Support) reports to Gary Burnett, Vice President, Customer Services Division.

## **7. SI Business Objectives**

NCR is pursuing SI work as a natural consequence of its customer orientation—it sees provision of “thought leadership” and follow-on hardware/software sales, as well as strengthening of its non-SI business and responding to its customers’ demands, as primary motivators.

## **8. SI Capabilities Evaluation**

NCR offers a complete range of SI services. NCR offers every service identified by INPUT as necessary for a successful SI services vendor. In some cases, NCR uses an alliance to fill in for a missing capability; in other cases, an alliance strengthens NCR’s existing capability. As shown in Exhibit NCR-2, NCR has rated its in-house SI capabilities very conservatively.

Well-known and highly respected in financial and retail/distribution organizations but relatively unknown outside its usual markets, NCR’s Systems Integration and Support unit presents to its SI clients the following benefits:

- NCR offers a core group of experienced project managers
- NCR provides excellent technology knowledge
- NCR’s services require low financial risk
- NCR is an open systems vendor—its products and services are geared toward solving the problems of interoperability in a multivendor computer and network operating environment
- NCR is a total service provider

Two of NCR’s greatest strengths are its depth of expertise in the core areas of software design and development and project management, and its breadth of alliances to fill out and strengthen its capabilities in other areas, so that NCR can properly offer all required SI services.

## EXHIBIT NCR-2

## NCR's SI Capabilities Ratings

Capability	Exists (Yes/No)	Strength	Alliance (Yes/No)
Business consulting	Yes	Low	Yes
Design methodology	Yes	Medium	No
Design/Integration	Yes	Medium	No
Project management	Yes	High	No
Software development	Yes	Medium	Yes
Education/Training/ Documentation	Yes	High	Yes
Packaged applications software	No	—	Yes
Packaged systems software	Yes	Medium	Yes
Standard computer hardware	Yes	High	Yes
Custom computer hardware	No	—	Yes
Communications hardware	Yes	Medium	Yes
Network management/ operations	No	—	Yes
Service and repair	Yes	High	Yes
Software maintenance	Yes	High	Yes

## 9. SI Strategic Alliances

NCR uses both long-term and contract-by-contract agreements to augment its products and services offerings. The Systems Integration and Support organization uses long-term or contract-by-contract agreements to make available specific hardware or software products or services that NCR does not produce, to better answer a specific client's requirements. In this way NCR can perform as a total system solutions vendor.

NCR declined to identify any of its strategic alliances. It remains to be seen whether anything will result from the interest in NCR shown by AT&T.

## 10. SI Capabilities Summary

NCR offers all the capabilities required to compete in the SI market place.

Core area (software development/implementation and project management) expertise is one advantage held by NCR; another is depth of experience in the financial and retail distribution industries. INPUT believes that, used properly, NCR's alliances could make NCR a leader in the SI marketplace within a few years.

Other strengths grow out of NCR's position as an open systems vendor. By promoting the use of industry standards (such as UNIX and microchannel-based workstations), NCR is seen as a contributor to the solution of problems with incompatible systems that must be made to interact. NCR's network management capabilities will clearly be necessary to support the increasingly connected information systems marketplace.

One weakness in NCR is a perceived lack of credibility outside its former market niches. INPUT believes that, in the short term, NCR would benefit from well-publicized teaming arrangements with larger and better-known SI services vendors whose successes would give NCR much-needed visibility in the broader SI market place.

Exhibit NCR-3 summarizes INPUT's evaluation of NCR's SI capabilities.

## EXHIBIT NCR-3

**INPUT's Evaluation of NCR's SI Capabilities**

Strengths	Weaknesses
NCR's expertise in financial and retail organizations	NCR's unfamiliarity with other vertical markets
NCR is an open systems vendor	
NCR's broad array of capabilities gained through alliances	
NCR's core area expertise	

**11. SI Marketing Strategy**

NCR's marketing strategy is highly focused on the financial services (banking and related) and retail and wholesale distribution industries. Although NCR has limited the scope of its marketing, it has shown itself to be interested in supporting each of its clients for the long haul, as evidenced by its emphasis on strong client relationships. INPUT believes that NCR has particularly strong capabilities in the financial services and retail industries that give NCR a well-defined advantage in these markets.

- **Competitors.** NCR declined to identify its competitors as a matter of policy.
- **Positioning.** As a computer manufacturer, NCR is well-positioned as a leading supplier of equipment and software to the banking and distribution industries. As a systems integrator, NCR—through its strategic alliances—can reinforce its role as a one-stop source of fulfillment of a client's needs. NCR has dropped its former proprietary systems architecture in favor of an open systems architecture.
- **Promotion.** INPUT notes that NCR makes very little use of common promotion methods, except for: public seminars, advertising (general business publications), and word-of-mouth/client referrals. NCR rates all these methods as having low effectiveness. Almost uniquely, NCR noted that 100% of its federal SI business results from responses to federal requests for proposals. Seventy-five percent of its commercial SI business is gained similarly; 25% comes from existing customers.

Although NCR declined to disclose its total SI revenues or commercial/federal breakouts, NCR did disclose the following average mix of values derived from commercial contracts only:

- |                         |     |
|-------------------------|-----|
| • Equipment             | 60% |
| • Packaged software     | 25% |
| • Professional services | 15% |

## 12. SI Customer Base

NCR declined to disclose any information about its customer base and, thus, about its successful SI projects; however, NCR is an acknowledged leader in providing accounting and computing equipment to the banking and finance and retail distribution industries.

## 13. Summary and Future Directions

NCR's strengths are its expertise in meeting the needs of the financial services and retail vertical industries, its emphasis on client relationships, its support for open systems, and the breadth of its capabilities supported by strategic alliances. Also, NCR has a large customer base in the financial services and retail industries.

Regardless of the outcome, NCR's pursuit by AT&T can only enhance its credibility in the broader SI marketplace.

NCR will remain a viable contender in its chosen market niches. INPUT expects NCR to broaden its markets to include all its target industry groups.

## COMPANY PROFILE

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### NYNEX Information Solutions Group

#### 1. Key SI Contacts

A. Theodore Engkvist  
President  
NYNEX Information Systems Group  
4 West Red Oak Lane  
White Plains, NY 10604

Dr. Gad J. Selig  
Vice President & General Manager  
NYNEX Information Systems Group  
4 West Red Oak Lane  
White Plains, NY 10604

#### 2. Description of Principal Business

NYNEX—a combination of the former New York Telephone and New England Telephone companies—came into being as a result of the break-up of the Bell system in 1984. In common with the other regional Bell operating companies (RBOCs), NYNEX believed that in the long term it could not prosper offering only traditional, regulated telephone service.

One of NYNEX's strategic decisions was to enter the information services and software business. In 1987, NYNEX created the Information Solutions Group (ISG). One segment of ISG offers products and services developed internally by NYNEX constituents: NYNEX Computer Services Division and the NYNEX Development Company.

However, the greater part of ISG has been created via acquisition. Its major acquisitions include:

- AGS Computers (1988)
- The BIS Group (1986)
- Telco Research Corporation (1985)
- The Data Group (1985)

Section 6, below, shows the current organizational structure of NYNEX ISG units.

The different ISG business units provide NYNEX an opportunity to offer a wide range of SI services to several key vertical markets in both the U.S. and Europe.

ISG has 5,500 employees, and INPUT estimates that 1989 revenue for current ISG units was over \$500 million. Only \$100 million of this revenue is SI revenue (see Exhibit NYN-1); however, the majority of ISG products and services can potentially be mobilized for SI projects.

EXHIBIT NYN-1

<p style="text-align: center;"><b>NYNEX</b> <b>1989 Systems Integration Revenues</b></p>	
Business Component	\$ Millions
Federal	10
Commercial	90

### 3. Competitive Position

Many of NYNEX ISG's strengths flow directly and indirectly from the fact that its parent is NYNEX. NYNEX has adopted a long-term strategy to become a dominant player in the information and communications products and services marketplace. Some of NYNEX ISG's strengths are listed below:

- Because this is a strategic business area for its parent, ISG has received (and will, no doubt, continue to receive) a significant level of investment for both internal development and for acquisitions. This does not mean that ISG is not viewed as a commercial, profit-making undertaking. However, the long-term positioning of ISG will not necessarily be sacrificed to quarter-to-quarter performance targets; the pressure for short-range performance is a problem experienced by some of NYNEX's public company competitors.
- The AGS acquisition brought bulk to ISG, including offices, contracts, and professional resources. It was a similar type of thinking that, in part, prompted IBM to make its 1989 investment in Computer Task Group, one of AGS's competitors.



- ISG is able to offer a mosaic of key products and services to key business sectors:
  - The financial services sector (banking and securities) through BIS, DISC, Inc. and Vista Concepts, Inc.
  - The telecommunications sector through Telco Research, AGS, and NYNEX Development.
- NYNEX's Complex Systems Integration Group (CSIG) contracts and mobilizes NYNEX ISG resources and directs these resources to client needs and develops new systems and network integration platforms.
- NYNEX's CSIG group is well-positioned to focus its SI strategies on the growing number of network integration opportunities and is doing so.

NYNEX ISG has weaknesses; these are intertwined with—in fact, almost mirror images of—its strengths:

- Its parent, NYNEX, is still legally constrained from offering several products and services that would, according to current legal doctrine, take unfair advantage of NYNEX's position as monopoly provider of communications services. The two areas in which constraints most affect NYNEX's position as a systems integrator in the U.S. are:
  - Manufacturing communications or computer hardware
  - Offering on-line remote processing of customers' data

These constraints have only been a minor hindrance so far. In the longer run, these barriers could create increasing problems if they remained in place; however, one school of thought believes that these legal prohibitions will be reduced or eliminated in the next few years. Since this issue is, to some extent, a political one, it is difficult to say with certainty what the outcome will be.

- A more immediate problem is that the bulk of AGS' work is essentially project-related, rather than being SI in nature. NYNEX's objective is to add increasing amounts of value-added work to AGS in order to raise its capabilities and margins. The danger is that the sheer size of AGS will tend to keep it headed in the same project-oriented direction for some time to come.
- NYNEX has significant presence in the financial services, state and local government and manufacturing vertical markets. However, NYNEX has a much lower level of expertise and more limited product offerings in most other vertical markets. This situation contains two problems:

- NYNEX will find it harder to break into other markets without additional acquisitions.
- If the banking and brokerage sectors should themselves run into financial difficulties, NYNEX could be disproportionately affected.
- The NYNEX SI strategy is dependent on internal and external resources being orchestrated both on an ongoing (strategic) basis and for specific (tactical) SI jobs. This is difficult enough in any multi-divisional organization where different units have their own goals and schedules. This task is even more difficult in an organization that is built up through a number of different acquisitions, each with its own culture and method of operations.

In summary, NYNEX's problems are also its opportunities, and vice versa. That the problems inherent in NYNEX's strategy were evident from the beginning is grounds for optimism about NYNEX's approach. NYNEX has a strong management group that is working to take advantage of its position in the market.

#### 4. Markets Served

NYNEX ISG is particularly strong in the U.S., where INPUT estimates it receives over two-thirds of its revenues. BIS gives NYNEX a well-placed European position in its areas of expertise and has provided NYNEX with a position and operating units along the Pacific Rim.

NYNEX is exceptionally strong in the financial services markets, with its software and services offerings by BIS, Vista Concepts, and DISC, as well as AGS' professional services experience in this area.

Telco Research, NYNEX Development, and CSIG give ISG special telecommunications experience and business entrée.

AGS has manufacturing communications software as well as professional services experience in factory systems; however, NYNEX ISG does not yet have manufacturing sector experience that is nearly as deep as its financial sector experience.

#### 5. Recent Events

As noted above, NYNEX ISG has grown largely through acquisition. Acquisitions are made by NYNEX ISG itself, as well as through its AGS subsidiary, depending on how the acquisition will fit into ISG's overall business.

Examples of this strategy are two 1989 acquisitions by NYNEX's AGS Information Services:

- In July, AGS bought Multiple Technologies, a 200-employee, Michigan-based professional services firm specializing in the discrete manufacturing sector.
- In November, AGS acquired TELO Technologies, previously a subsidiary of Tampa Electric. TELO offers products and services to the utility industry.

This appears to be part of a pattern where small and/or lower value-added acquisitions are folded into AGS, rather than being maintained as separate entities or added to CSIG.

## 6. SI Organization

NYNEX ISG has 19 operating entities that are organized into seven operating units, as shown in Exhibit NYN-2. The NYNEX Complex Systems Integration Group (CSIG) is the chief vehicle for providing SI services, as its name would imply. CSIG typically serves as a general contractor, calling in resources from the other units of ISG, other parts of NYNEX, other subcontractors, and long-term or single-project partners. Services that CSIG provides are shown in Exhibit NYN-3.

The competencies of the other ISG units are briefly described below:

- *AGS Information Services*—Provides professional services to over 1,000 clients, largely through the design and implementation of custom information systems. AGS has expertise across many functional and vertical areas.
- *AGS Management Systems*—Provides project management software and system development methodologies
- *DISC*—Provides cash management, account reconciliation, and regulatory compliance software to U.S. banks
- *Systems Strategies*—Provides UNIX-to-IBM and VAX-to-IBM communications software
- *Vista Concepts*—Provides securities processing and trust accounting software
- *Eastern Design Company*—Supplies engineering and technical personnel
- *EDC Temps*—Supplies temporary office personnel
- *BIS Banking Systems*—Provides international banking software and services

EXHIBIT NYN-2

# **NYNEX Information Solutions Group, Inc. Organization**

- NYNEX Complex Systems Integration Group
- AGS Computers, Inc.
  - AGS Information Services, Inc.
  - AGS Management Systems, Inc.
  - DISC, Inc.
  - Systems Strategies Inc.
  - Vista Concepts, Inc.
  - Eastern Design Company, Inc.
  - EDC Temps, Inc.
- The BIS Group Ltd.
  - Banking Systems
    - BIS Banking Systems Ltd.
  - Information Systems
    - BIS Applied Systems Ltd.
    - BIS Beecom International Ltd.
  - Marketing Information
    - BIS Mackintosh Ltd.
    - BIS Shrapnel Pty. Ltd.
    - BIS CAP International
  - Direct Marketing
    - Christian Brann Ltd.
    - Contact 24 Ltd.
- The DATA Group Corporation
- NYNEX Computer Services
- Telco Research Corporation
- NYNEX Development Company

EXHIBIT NYN-3

## NYNEX Complex Systems Integration Group Services Offered

- Consulting
  - Business strategy
  - Systems and communications needs analysis
  - Information/communications systems planning
  - Technology assessment
  - Equipment and systems evaluation and selection
  - Feasibility studies and RFP evaluation
  - Information/communications systems organization audits
- Systems and Network Design and Development
  - Prime contractor
  - Systems/network design, engineering, and development
  - Hardware, software and network integration
  - Custom software, development
  - Integrated network management systems
  - Systems integration development tools and methodologies
  - Local-area/metropolitan-area networks
- Systems Implementation
  - Project management
  - Contract management
  - Procurement, prototyping, testing
  - Documentation
  - Conversion
- Public and Private Training and Education
  - User skills
  - Technical seminars
  - Executive awareness seminars
  - Development skills
- Systems/Network Operation
  - Facility/network management
  - Technical support
  - Customer support
  - Maintenance
- Systems Re-Engineering
  - Maintenance
  - Redesign
  - Tools

- *BIS Applied Systems* and *BIS Beecom*—Provide professional services in the U.K.
- *BIS Mackintosh*, *BIS Shrapnel*, and *BIS CAP*—Provide consulting and market information to the information services industry
- *Christian Brann* and *Contact 24*—Provide direct marketing services in the U.K. and Australia
- *The DATA Group*—Provides software and services to customer services organizations
- *NYNEX Computer Services*—Provides professional services and video information services integration
- *Telco Research*—Provides call accounting software and professional services
- *NYNEX Development Company*—Develops new business opportunities. Currently developing products and services in LAN integration, integrated network management, and electronic funds transfer

## 7. SI Business Objectives

NYNEX's principal business objectives are:

- To obtain profitable business
- To control its account base
- To strengthen its non-SI business

Less important are follow-on hardware sales and follow-on systems operations contracts—which is reasonable, given its current legal constraints. NYNEX ISG is continuing to target a 25% compound annual growth rate and to increase margins. It has been getting half of its SI business from current accounts and half from new accounts.

## 8. Internal SI Capabilities Evaluation

### a. Business Consulting

CSIG offers business consulting directly as part of its front-end value-added services. BIS Applied Systems also offers business consulting as well as BIS Banking Systems in its focused area of expertise.

### b. Design Methodology, Design and Integration, Project Management, Software Development and Education, Training and Documentation

AGS Management Systems offers a series of software packages for project management as well as a system development methodology. BIS offers the Integrated Programming Support Environment (IPSE) package.

#### **c. Packaged Application Software**

Different operating units of ISG offer extensive applications packages, as described in Section 7, above.

#### **d. Packaged Systems Software**

Systems Strategies offers the connectivity software previously described.

#### **e. Standard Computer Hardware**

NYNEX does not generally offer standard computer hardware. One of the few exceptions is hardware and software from the DataMyte Corporation used in AGS Information Systems' factory data collection offering.

#### **f. Custom Computer Hardware**

NYNEX does not develop customized hardware.

#### **g. Network Management and Operations**

Given NYNEX's principal business, it is not surprising that network-oriented products and services are threaded into many of the offerings of ISG units:

- CSIG: Integration services
- AGS: Extensive development services
- Systems Strategies: Connectivity products
- Vista Concepts: On-line trading systems
- NYNEX Computer Services: Consulting
- Telco Research: Products and consulting for telecommunications management
- NYNEX Development: Local-area network (LAN) integrated products and services

## **h. Service and Repair**

Services and repair are not offered by ISG but are offered by another NYNEX affiliate, NYNEX Business Centers.

## **i. Software Maintenance**

Maintenance is offered as a standard part of NYNEX's various software products and is offered by the professional services units as a separate service to clients.

## **9. SI Strategic Alliances**

The NYNEX Corporation has many strategic alliances, ranging from telecommunications enterprises (e.g., France Telecom, Northern Telecom, Singapore Telecom) to relations with suppliers of its computer store division.

NYNEX ISG has loose reselling alliances with IBM, DEC, Stratus, and Tandem. None of these are exclusive or particularly close relationships. In Tandem's case, for example, NYNEX was the ninth integrator with which Tandem formed a reselling arrangement (others included BCS, EDS, SHL, SAIC, and GTE). NYNEX also has relationships with the leading on-line transaction processing hardware companies and inter-LATA carriers like MCI, AT&T, Telenet, and Tymnet.

## **10. SI Capabilities Summary**

NYNEX ISG has an exceptionally wide range of products and services that it can marshall under its SI umbrella. In addition, the NYNEX Complex Systems Integration Group can use other parts of NYNEX, subcontract, or form alliances with other vendors to bid and win systems and network integration contracts.

## **11. Marketing Strategy**

NYNEX ISG's marketing strategy is to build on its strong presence, including:

- The NYNEX Corporation's industry, systems, and network experience
- ISG's position in financial services, utility, manufacturing, and state/local government markets
- The market positions of AGS, BIS and Telco Research
- Growing focus on network integration (including complex LANs, metropolitan-area networks (MANs), and network operations management)



Being already strong in these diverse areas will allow ISG and its CSIG unit to directly attack the SI marketplace.

NYNEX's competitors exist on two levels:

- Andersen, CSC, IBM, and EDS for large, complex SI projects
- Computer Task Group and other value-added professional services firms for less complex SI jobs

## **12. SI Customer Base**

NYNEX indicates that since 1987 it has worked on 15 commercial SI jobs with an average contract value of \$25 million. NYNEX has not been involved in any significant U.S. federal SI projects, as its focus from the beginning has been on commercial and international markets.

## **13. Summary and Future Direction**

INPUT believes that the near-term future of NYNEX's SI efforts will have these characteristics:

- Focus on contracts with high network integration content
- Further increase in the synergies between the different ISG units
- Selective acquisitions to increase its capabilities in targeted markets

NYNEX is obviously in SI (and information services) for the long haul. Other SI firms should expect NYNEX to be an even more aggressive competitor in the future.



## COMPANY PROFILE

PRC, Inc.

### 1. Key SI Contacts

#### **Commercial SI**

Bob Laurence  
President, Commercial Systems' Group  
PRC, Inc.  
1500 Planning Research Drive  
McLean, Virginia 22102

#### **Federal SI**

Paul Lombardi  
Vice President and Group General Manager,  
Applied Management Group  
PRC, Inc.  
1500 Planning Research Drive  
McLean, Virginia 22102

### 2. Description of Principal Business

Founded in 1954, PRC, Inc. (PRC) is currently a subsidiary of Black & Decker, a manufacturer of light industrial equipment and a broad range of home appliances and power tools. Merged with Advanced Technology, Inc.—another Northern Virginia-based management consulting and professional services firm—when they were both acquired from Emhart Corp. in 1989, PRC continues its primary lines of business: management consulting and advisory services, professional services (including information systems design, development, implementation and operations), and systems integration.

PRC has been in the commercial SI business for 15 years and in the federal SI business for 10 years.

INPUT's estimates of PRC's SI revenues for 1989, and its current SI staffing, are presented in Exhibit PRC-1.

PRC's SI projects are rather evenly split between commercial and federal projects; however, the dollar value is greater on the federal side. PRC reports that its average federal SI project has a value nearly four times the value of its average commercial SI project (more than \$6 million versus more than \$1.5 million, respectively).

## EXHIBIT PRC-1

**PRC's 1989 SI Revenue and SI Staffing**

SI Sector	Staffing	1989 Revenue (\$ Millions)
Commercial*	500-1,000	175
Federal*	2,000	200

\*Full-time only

**3. Competitive Position**

PRC gains competitive advantage from the breadth of its service offerings, which cover management consulting/professional services through follow-on operations. PRC gains additional advantage from its use of alliances to strengthen its capabilities and increase its responsiveness in the delivery of services and products. PRC also enjoys widespread name recognition and an excellent reputation, having been in business in the Washington, D.C. metropolitan area for more than 15 years.

**4. Markets Served**

PRC's primary targets in the SI market are vertical industry markets. The following targets were cited by PRC in INPUT's 1990 survey:

- Federal (DoD and non-DoD) agencies
- Large defense contractors
- Public utilities
- Commercial companies
- State and local governments

PRC cited response to customers' demands, control of its account base, and revenue/profit potential as its primary motivators in pursuing these targets. Secondary motivations were follow-on hardware/software sales and facilities management contracts, and strengthening its non-SI business.

**5. Recent Events**

In December 1986, PRC was acquired by Emhart. (At the end of 1987, Emhart also acquired ATI.) In April 1989, Emhart was acquired by Black & Decker. Shortly after, Black & Decker announced its intention to sell off both PRC and ATI. Black & Decker is currently merging the operations of PRC and ATI under the name PRC, Inc. This merger is scheduled to be completed by January 1991.

In November 1990, the Black & Decker Corp. decided to retain its systems integration subsidiary, after an 18-month search failed to yield a buyer.

In keeping PRC, Black & Decker is betting the company can build a commercial systems integration presence from its federal government base. Black & Decker also intends to purchase outsourcing services from PRC to cut costs and improve productivity.

## 6. SI Organization

Like many of its counterparts in the SI marketplace, PRC's SI organizations use a matrixed management structure. Although PRC did not identify its specific management structure, because of the current organizational changes in process, INPUT would expect it to permit PRC to use a few technology-oriented implementation groups to support any number of specialized client-oriented marketing groups.

Perhaps as a result of dealing heavily with the DoD, PRC's SI operations clearly support a mission-oriented management philosophy. The organization is distributed according to the percentages shown in Exhibit PRC-2.

EXHIBIT PRC-2

### Distribution of SI Staff Effort at PRC

SI Capability	Percentage
Management, support and planning	6
Legal support/contract administration	3
Project management	20
Systems development/implementation	45
Hardware/software evaluation/acquisition	15
Hardware engineering	6
Sales	3
Other security/administration	2

Like other SI vendors who deal principally with the DoD, PRC has chosen to operate its management and control functions in both centralized and decentralized fashion, as the particular circumstances require. Exhibit PRC-3 lists specific organizational responsibilities as either centralized, decentralized or both.

## EXHIBIT PRC-3

### Centralization/Decentralization of SI Business Functions at PRC

Responsibility	Commercial	Federal
Strategy & long-range planning	C	B
Marketing & promotion	D	B
Account management/sales	D	B
Contract review/approval	D	B
Project management/control	D	D
Implementation/development	D	D
Hardware/software acquisition	D	D
Systems operations	D	D

C = Centralized, D = Decentralized, B = Both

#### 7. SI Business Objectives

In common with other management services vendors, as well as traditional hardware vendors, PRC sees SI as a required response to customers' demands. As a successful management services consulting firm, PRC also cited the expectation of revenues/profits from its SI undertakings, as well as increasing control of its existing customer base, as primary objectives for its SI business. Secondary objectives include strengthening its non-SI business and follow-on business with the same clients.

#### 8. SI Capabilities Evaluation

PRC offers a full range of SI services, including consulting, design/integration, project management, hardware, communications products, systems software, etc. INPUT concludes from the concentration of SI effort in the area of application design and development, that this is the area of PRC's greatest capability and, therefore, where it has greatest marketing potential. PRC was one of the first companies to deploy an open systems operation based on the design of the Patent and Trademark Office (PTO) project. PRC is a recognized industry pioneer and leader in open systems architectures.

PRC does not rely only on its in-house capabilities. Alliances strengthen almost every SI capability that PRC offers, whether the in-house capability has great or little strength. INPUT sees this as a strength of PRC, leveraging both its strengths and its weaknesses to increase the scope and the responsiveness of its services. A substantial portion (approximately 20%) of PRC's SI effort is dedicated to project management services.

Coupled with PRC's extensive use of alliances, it appears that PRC can undertake many more concurrent SI projects than its staff could reasonably handle. PRC's self-assessment and use of alliances is described in Exhibit PRC-4.

## EXHIBIT PRC-4

### PRC's Self-Assessment of SI Capabilities and Use of Alliances

Capability	Strength (High/Medium/Low)	Alliance (Yes/No)
Business consulting	Medium	Yes
Design methodology	High	Yes
Design/integration	High	Yes
Project management	High	No
Software development	High	Yes
Education/training documentation	High	Yes
Packaged applications software	Medium	Yes
Packaged systems software	Medium	Yes
Standard computer hardware	Medium	Yes
Custom computer hardware	Medium	Yes
Communications hardware	Medium	Yes
Network management/operations	High	Yes
Service and repair	Medium	Yes
Software maintenance	Medium	Yes

It is interesting to note that PRC enhances and supplements all areas but its project management capabilities. It demonstrates how critical this activity is to PRC's success. PRC states that it seeks out opportunities to be both the prime contractor and subcontractor, as a particular project requires.

PRC rated itself highest in the software development and implementation areas; this is consistent with PRC's notable success with the operation of a multiple listing service for the real estate industry.

#### 9. SI Strategic Alliances

PRC is nearly unique in the scope of its alliances; other vendors, such as DEC, may have more alliance partners, but few others use alliances in so many areas, as shown in Exhibit PRC-4. PRC does not follow a corpo-

rate alliance program governing its use of alliances. PRC's alliances are primarily on a contract-by-contract basis. However, the breadth of PRC's use of strategic alliances clearly show it to be a full-service, fully responsive SI services vendor.

PRC takes a pragmatic view with respect to strategic alliances, using its alliances, as appropriate, to accomplish the following goals:

- New market penetration
- Access to new technology development and product distribution
- Reduced development costs in specialized areas
- To permit PRC to participate as prime or subcontractor, as appropriate

PRC uses long-term alliances primarily for market focus or penetration. *Ad hoc* alliances are used to achieve the strongest possible SI project team to meet the client's needs.

A brief sample of PRC's alliances is presented in Exhibit PRC-5.

EXHIBIT PRC-5

#### Brief Sample of PRC's SI Alliances

Alliance With	Purpose
DEC	Computer hardware maintenance
HP	CRT terminals
IBM	Hardware maintenance
Xerox	Hardware—new technology

### 10. SI Capabilities Summary

PRC offers the full range of SI capabilities to compete in the SI marketplace.

Alliances, covering nearly every important area, are a major advantage. INPUT believes that PRC's creative use of alliances to strengthen, as well as broaden, its services offerings should permit it to grow at a faster rate than some more conservative SI services vendors. PRC enjoys exceptional name recognition in the marketplace.

Some of PRC's major strengths are the following:

- Use of CASE/software engineering for large-scale, complex systems implementations



- Ability to offer industry-specific software products, such as the Multiple Listing Service for the real estate industry
- Specialized capabilities in artificial intelligence, computer security and software engineering
- Specialized communications expertise in all the areas of local-/wide-area networks and satellite communications
- Document imaging systems and integration

INPUT found no major weaknesses in PRC's SI services offerings that could interfere with its success in the SI marketplace.

## 11. SI Marketing Strategy

PRC's SI target markets are primarily vertical industries/organizations. PRC selects its market targets carefully, according to the following criteria:

- Value-added content of project
- Potential for application of existing software technical expertise
- Potential for technology transfer, or previous work for client
- Potential profitability of a project

PRC is organized into three main operating groups:

- The Commercial Systems Group provides nationwide computer-based Multiple Listing Service (MLS) operations, and computer-aided dispatch systems. The group serves as the commercial SI arm of the company.
- Applied Management Group is oriented toward systems integration, information and imaging systems, and facilities operation and maintenance, primarily for the U.S. government.
- Engineering Technology Group is primarily focused on tactical systems integration and technical services in support of C<sup>3</sup> systems, combat, and space systems for federal government agencies.

In addition, environmental Management, Inc. is a wholly owned PRC, Inc. subsidiary, focusing on the environmental services marketplace.

PRC, in its SI operations, clearly has a wide range of expertise available to meet a client's specialized requirements.

- Competitors - PRC's primary competitors in both the commercial and federal sectors of the SI marketplace are identified in Exhibit PRC-6.

## EXHIBIT PRC-6

**PRC's Primary Competition**

Sector	
Commercial	Federal
CSC EDS IBM TRW	CSC Unisys SAIC Martin Marietta

- Positioning - PRC has positioned itself as a full-service SI services vendor, capable of delivering responsive and productive systems. Leveraging its record of on-time delivery, its technical strength and long-term track record, PRC emphasizes its implementation and integration capabilities and its post-implementation operations support offerings.
- Promotion - PRC relies on word-of-mouth client referrals, buttressed by trade shows and advertising in trade and industry publications. PRC finds advertising somewhat less effective than either trade shows, conferences, or client referrals.

**12. SI Customer Base**

PRC reports having undertaken over 200 SI projects since the beginning of 1988; these projects average more than \$1.5 million in the commercial sector and more than \$6 million in the federal sector. Some of PRC's typical SI projects are presented in Exhibit PRC-7.

## EXHIBIT PRC-7

Examples of PRC's SI Projects	
Customer	Description
Dept. of Commerce	Patent & Trade Mark Office Automated Patent System
Dept. of Veterans Affairs U.S. Senate	Integrated Hospital System Network integration —provide data network for entire U.S. Senate
Navy	EDMICS - a CALS project to automate engineering data
NASA HQ	Operations management and communications network design, implementation and maintenance
General Dynamics	Integrated system for electronic capture and distribution of drawings

### 13. Summary and Future Directions

PRC's strengths include its recognized success in developing, implementing, and operating industrywide application systems, such as the Multiple Listing Service. Also, PRC's ability to offer all required SI capabilities, either in-house or via a strategic alliance, provides additional strength.

INPUT found no major weaknesses in PRC's SI capabilities. The move by parent Black & Decker to retain and invest in PRC, Inc.'s future demonstrates its confidence in the firm's capabilities and its ability to compete effectively in the SI marketplace. INPUT expects PRC to be a strong competitor in the SI marketplace as long as it chooses to be.

Successful for 35 years, through good and bad economic times, PRC is not just doing "something" right; it is clearly doing nearly everything right.



## COMPANY PROFILE

### Price Waterhouse

#### 1. Key SI Contacts

Mr. Tom Beyer  
MCS Vice Chairman  
Price Waterhouse  
1801 K Street  
Washington, D.C. 20006

Mr. Robert H. Cawly  
Managing Partner  
Applied Technology Center  
1410 North Westshore Boulevard  
Tampa, FL 33607  
(800) 825-1282

#### 2. Principal Business

Price Waterhouse is a leading management consulting organization focusing on all aspects of enterprise integration. Price Waterhouse has been active in the federal SI market for nearly 10 years and in the commercial SI market for five years.

Price Waterhouse reports its fiscal year 1989 (July 1989-June 1990) SI revenues as approximately \$400 million. This figure is broken down as shown in Exhibit PW-1. Equipment costs included in systems integration projects are not included in these revenues.

PW-1

#### Price Waterhouse Systems Integration Revenues 1989

Business Component	\$ Millions
Commercial	325
Federal	75

#### 3. Competitive Position

Price Waterhouse maintains a quality reputation as a management consulting firm. Its experience in project management and its understanding of the client's needs, coupled with its vertical industry and risk contain-

ment knowledge, give it a competitive advantage in many market and industry segments. Major service offerings from Price Waterhouse include:

- Software refurbishment using proprietary systems reengineering products such as ARRAE
- Industry-specific software for the retail, oil and gas, utilities, banking, and insurance markets
- Generic package software implementation, including supporting tools and methodologies
- Strategic selling using proprietary Sales Force Automation and Marketing software
- Change integration services to assist companies in introducing new technologies through business reengineering

Price Waterhouse has a strategic alliance program to complement all services it provides. Through the Price Waterhouse National Vendor Alliance Program, long-term alliances with various package software vendors permit Price Waterhouse to develop tailored solutions for clients' needs.

Price Waterhouse has taken an innovative approach to the SI market by focusing on Enterprise Integration. It has developed a service plan that embodies a "Client Bill of Rights" to ensure its clients receive value-added service. This provides Price Waterhouse with a means of measuring and managing its client relationships through its Quality Management Program.

A series of knowledge-based tools has been developed by Price Waterhouse to reduce the labor and resources required for software development and package implementation. These tools were developed to strengthen Price Waterhouse's competitive position in large SI projects, and to guarantee a high degree of client participation and ensure client system ownership.

#### **4. Markets Served**

Price Waterhouse's primary targets in the SI market include both functional and vertical industry targets, as shown in Exhibit PW-2.

## EXHIBIT PW-2

**Price Waterhouse's SI Target Markets**

Functional	Vertical Industry
Financial and treasury management	Manufacturing
Human resources	Retail
Sales and marketing	Oil and gas Utilities
Software re-engineering/ CASE tools	Law firms
Business re-engineering	Insurance Banking

The principal motivation for Price Waterhouse's services in these markets centers on serving its existing clients with the services they require. Price Waterhouse markets its services primarily to major multinational corporations. Typical Price Waterhouse clients include:

- Fortune 1000, Forbes 200 companies
- Companies with revenues greater than \$1 billion
- Large public sector operations and government agencies
- Financial institutions with over \$1 billion in assets
- Significant public utilities and oil companies

Price Waterhouse expects to provide its (or alliance partners') proprietary software as a byproduct of its SI business. The firm is retaining strong relationships with its existing client base and strengthening its non-SI services in strategic management and industry consulting programs.

**5. SI Organization**

Both Price Waterhouse's commercial and federal SI organizations report to Tom Beyer, MCS Regional Vice Chairman. Price Waterhouse's operating functions are aligned to the geographic market, with "expert" resources organized nationally to provide local practice support, as shown in Exhibit PW-3. The Applied Technology Center and Price Waterhouse Technologies are two such organizations.

Price Waterhouse employs approximately 2,000 full-time specialists in its commercial SI operation; approximately 500 full-time employees are assigned to its federal SI operation.

EXHIBIT PW-3

### Price Waterhouse National/Regional SI Business Alignment

Responsibilities	Commercial	Federal
Strategy and long-range planning	C	C
Marketing and promotion	C	C
Client management	D	D
Contract review/approval	D	D
Project management/control	D	D
Implementation/development	D	D
Hardware/software acquisition	D	D
Vendor alliances	C	C
Technology research and development	C	C
Quality management	D	D

C=Centralized, D=Decentralized, B=Both

#### 6. SI Business Objectives

Unlike most traditional equipment-vendor-turned-SI-services-vendor, Price Waterhouse does not provide a distribution channel to sell computer hardware and software. Price Waterhouse's policy is to receive no commissions or markups for other products included in its integration projects. These savings from discounts and commissions are passed on to the client to reduce the overall cost of the SI projects.

Price Waterhouse's focus on SI is driven by the client and not the vendor. Accordingly, Price Waterhouse provides its service under Enterprise Integration, a concept to build the internal capability of the client, maintain focus on the business objectives, and provide value-added solutions leading to a mutually beneficial client relationship. In this respect, Price Waterhouse believes it has distinguished itself from traditional technology providers that provide hardware, software, or other technology as a means to drive their SI practices. Under Price Waterhouse's Enterprise Integration approach, a client still receives all of the benefits associated with an integration contract (i.e., prime contractor to assume risk, performance, etc.) but with a much greater degree of control in terms of cost and service delivery since Price Waterhouse contends that it is unbiased to a particular vendor's equipment or software.



Price Waterhouse has long-term alliances with packaged applications software vendors and various hardware vendors. In response to INPUT's SI survey, Price Waterhouse has identified a number of contract-by-contract alliances that strengthen its capabilities in a number of areas. These alliances are identified in Section 8.

## 7. SI Capabilities Evaluation

Price Waterhouse offers management advisory services that address all the requirements of the SI market; it offers products and technical services to satisfy most of the common SI requirements. These products and services satisfy all the requirements of the SI market in which Price Waterhouse presently chooses to compete. Exhibit PW-4 presents Price Waterhouse's self evaluation in the primary SI capabilities.

EXHIBIT PW-4

### Price Waterhouse's Evaluation of Capabilities

Capability	Strength	Alliance
Business consulting	High	No
Design methodology	High	No
Design/integration	High	No
Project management	High	No
Software development	High	Yes
Education/training/documentation	High	No
Packaged applications software	High	Yes
Packaged systems software	High	Yes
Standard computer hardware	High	Yes
Communications hardware	High	No
Network management/operations	Medium	Yes

## 8. SI Strategic Alliances

Price Waterhouse uses alliances to strengthen its SI capabilities. Primary alliances are with various packaged software vendors and hardware vendors. Given that Price Waterhouse audits many of the large hardware companies, special arrangements have been developed to provide client solutions, while protecting the independence of the audit relationship. Price Waterhouse does not disclose the products or services offered by its alliance partners. Exhibit PW-5 presents a sample list of Price Waterhouse's SI alliances.

## EXHIBIT PW-5

**Price Waterhouse  
Limited Sample of SI Alliances**

Vendor	Contract Basis
Third-party packaged software vendors	Strategic alliances
• Applications	
-Dun & Bradstreet Software	
-Walker Interactive	
-Oracle	
-Software 2000	
-JD Edwards	
-Tesseract	
-Integral	
-PeopleSoft	
-Comshare	
-Ross Software	
-SAP	
-IMRS	
• Tools	
-Index Technologies	
-Knowledge Ware	
-Bachman	
-McCabe	
-AdPac	
-AdvantEdge	
-Approximately 14 others	
EDS	Contract-by-contract
CSC	Contract-by-contract
IBM	Contract-by-contract
DEC	Contract-by-contract
Hewlett-Packard	Contract-by-contract
Texas Instruments	Contract-by-contract
Sequent	Contract-by-contract
Arix Corporation	Contract-by-contract

Clearly, Price Waterhouse sees packaged software as the key to long-term performance in the SI market.

### 9. SI Capabilities Summary

Price Waterhouse has restricted its SI offering to those capabilities that are best supported by the traditional management consulting organization. It offers none of the following directly: computer and communications equipment, systems software, custom computer hardware, equipment service and repair, and facilities management. It does, however, provide business consulting, systems design and integration, project management, and in-house software design and development.

Price Waterhouse shows strength in its software engineering capabilities, especially in its CASE tools and software re-engineering services. Also, its access to industry-specific software strengthens its position when it bids for services to a specific vertical industry.

Price Waterhouse shows a current weakness in that it is not staffed to address very large SI projects; however, its strengths clearly identify it as a capable player in the SI market. INPUT's evaluation of Price Waterhouse's SI capabilities is presented in Exhibit PW-6.

EXHIBIT PW-6

#### INPUT's Evaluation of Price Waterhouse's SI Capabilities

Strengths	Weaknesses
Industry-specific software In-house management expertise, especially project and program management Technical expertise, especially software engineering Long-term client support	Large project experience

### 10. SI Marketing Strategy

Price Waterhouse's marketing strategy is consistent with its matrixed management style; it targets a combination of functional and vertical industry markets (per Exhibit PW-2). Although Price Waterhouse targets only the largest companies as its preferred market, it must be considered somewhat a niche SI services vendor, since it has not chosen to provide follow-on services such as systems operation.

- Competitors - Price Waterhouse identifies its primary competition as the following vendors:

Commercial Market

Andersen Consulting  
Deloitte Touche  
Ernst & Young  
KPMG Peat Marwick

Federal Market

AMS  
Andersen Consulting  
Booz-Allen Hamilton  
KPMG Peat Marwick

All of the vendors identified above are management services vendors; none is an equipment manufacturer, which supports Price Waterhouse's focus on hardware vendor alliances for specific SI engagements rather than long-term relationships.

- Positioning - Price Waterhouse has positioned itself as a vendor of management/advisory services related to SI requirements; Price Waterhouse could serve as a prime contractor for a major SI project but it could not perform as a sole contractor, since it does not offer all the basic SI capabilities. Price Waterhouse has made a good start toward covering the required capabilities by its strategic and ad hoc alliances with well-known and acknowledged leaders in their own areas of excellence.
- Promotion - Price Waterhouse has implemented programs and tools to improve its capability and visibility in the SI market. In addition, it utilizes public seminars, direct sales, and cooperative sales, with and through its alliances, to identify new client prospects. Price Waterhouse has reported to INPUT that more than one-half its SI projects are undertaken in response to a request for proposal.

At this time, INPUT has no specific data on SI projects undertaken or completed by Price Waterhouse.

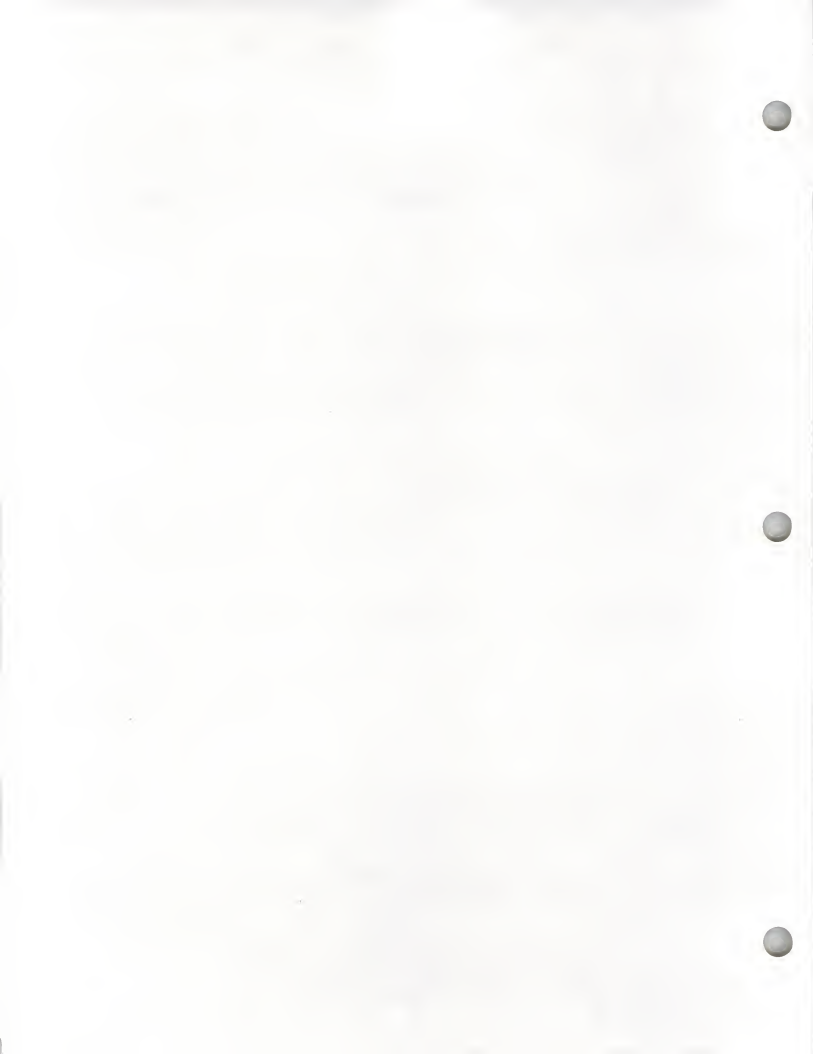
## 11. SI Customer Base

Consistent with its auditing and management consulting background, Price Waterhouse declined to identify any clients or projects for this report.

## 12. Summary

Price Waterhouse's strengths include its highly respected name as a management consulting firm, its project management expertise, methodologies, alliances, and its development of proprietary software engineering tools and techniques.

Its choice not to offer computer or communications equipment, including service and repair or operations, supports its focus on those areas where it has established in-house expertise and formed strong alliances. By focusing on what it does well and managing the sales and implementation process, Price Waterhouse will continue to remain strong in the systems integration market.



## COMPANY PROFILE

Science Applications  
International  
Corporation  
(SAIC)

### 1. Key SI Contacts

J.R. Beyster  
Chairman and CEO  
10260 Campus Point Drive  
San Diego, CA 92121

#### Federal

James E. Russell  
Vice President  
1710 Goodridge Drive  
P.O. Box 1303  
McLean, VA 22102

#### Commercial

Joseph P. Walkush  
Vice President  
10210 Campus Point Drive  
San Diego, CA 92121

### 2. Description of Principal Business

Science Applications International Corporation (SAIC), founded in 1969 as Science Applications, Inc., offers diversified research and engineering services as its primary product, with the researchers and managers themselves owning the company. The company offers technical and professional services in the fields of national security, energy, and environment and health. SAIC is also involved in the custom assembly of special-purpose computer systems and the manufacture of certain high-technology products.

Total fiscal 1988 revenue reached \$693.7 million, a 16% increase over fiscal 1987 revenue of \$599.7 million. Net income rose 20% from \$18 million in fiscal 1987 to nearly \$21.6 million in fiscal 1988. Fiscal 1989 revenues rose to \$865 million, \$360 million of which were from systems integration, as shown in Exhibit SAI-1.

Exhibit SAI-2 provides revenue estimates for the past six years. During this period, SAIC has shown remarkable revenue growth, averaging a compound annual growth rate (CAGR) of almost 20%. It has been estimated that 85% of this revenue comes from the federal government.

## EXHIBIT SAI-1

**SAIC  
1989 Systems Integration Revenues**

Business Component	\$ Millions
Federal	330
Commercial	30

## EXHIBIT SAI-2

**SAIC Historical Revenue**

Year	Revenue (\$ Millions)	Percent Increase
1984	354	22
1985	420	19
1986	533	27
1987	600	13
1988	694	16
1989	865	25

**3. Competitive Position**

SAIC started out as a defense contractor and has continued to support the Department of Defense (DoD) in a variety of classified and unclassified projects. In 1984, the company was selected as one of the ten system architects for the Strategic Defense Initiative.

In recent years, SAIC has branched out in a variety of federal areas, and these projects are expected to provide the basis for a commercial SI business. The most obvious example is SAIC's pursuit of business in hospital information systems. In 1986, SAIC won the contract for Stage I of what was originally called the Tri-Service Medical Information System (TRIMIS). This contract, valued at \$27.3 million, covered the design and development of a medical information system for military hospitals.

Stage II, valued at just over \$1 billion, was awarded in 1988. It covers implementation and follow-on support of what is now referred to as the



Composite Health Care System (CHCS). SAIC is using this project as a foundation for commercial hospital support.

In October 1989, SAIC acquired Di-Star Medical Systems Corporation, its principal subcontractor on CHCS. It had previously acquired the Software Products Division of Control Data Corporation. Using these two groups as well as other internal resources, SAIC developed its own product line for medical information named "SAIC-Care." As a result, INPUT expects SAIC to become a major force in commercial medical hospital systems, possibly even the leading systems integrator in that vertical industry.

SAIC is expected to repeat this approach in other areas. For example, it is now pursuing SI work for local television stations around the country, based on a successful project at a Chicago station. Rather than treating SI in a global sense, SAIC is pursuing discrete SI opportunities in those vertical industries in which it already has both experience and qualifications. Using this as a base, it will then expand to other related industry sectors.

#### 4. Markets Served

As already noted, SAIC services primarily the federal market, principally the DoD. In addition to the CHCS, described above, the following represents a partial list of other SI projects that SAIC is doing:

- FBI Automated Fingerprint Identification System
- Department of Energy Licensing Support System
- Sacramento Air Logistics Center
- Mid-Eastern Command, Control, and Communications System

SAIC classifies its business into two segments as follows:

- Technical services, which relate to national security and to energy, environment, and health include:
  - Design, development, and analysis related to defense policies, high-technology research, computer software and systems, tactical and strategic operations systems for military organizations, support, and manpower training programs
  - Research, analysis, engineering, technical services, software, and systems for government agencies and industrial customers related to nuclear energy, alternative energy sources, and a range of environmental studies, as well as health and human development programs

- Production of custom-designed and standard products—such as data display devices, sensors, and prototype instruments—under contract for government agencies and industrial customers. These products incorporate SAIC-developed hardware and hardware manufactured by others.

Exhibit SAI-3 presents a three-year summary of revenue by business segment.

## EXHIBIT SAI-3

## SAIC

### Three-Year Source of Revenue Summary (\$ Millions)

Item	Fiscal Year					
	1988		1987		1986	
	Revenue \$	Percent of Total	Revenue \$	Percent of Total	Revenue \$	Percent of Total
Technical Services						
- National Security	445.5	64	405.2	68	361.7	68
-Energy, Environment, and Health	187.3	27	147.2	25	132.1	25
Products and Other	57.8	8	44.9	7	35.4	7
Interest Income	3.1	-	2.3	-	3.5	-
Total	693.7	100	599.7	100	532.7	100

In its own promotional material, SAIC lists the following business areas:

- National security
- Energy
- Environment and health
- High-technology products
- Telecommunications and networking
- Computer software

The SI projects that SAIC takes on include most of these business areas.

## 5. Recent Events

In September 1989, SAIC hired Gordon E. Myers to serve as a senior vice president supporting systems integration and software development. Mr. Myers joined SAIC after a distinguished 20-year career at IBM. Most of Mr. Myers' experience has been in the federal area, although in his last position he managed the Commercial Solutions Development (CSD) organization of IBM's Systems Integration Division. His appointment signals a new emphasis by SAIC on systems integration.

In June 1989, SAIC won the contract to provide a new private data network to the Department of Veterans' Affairs. The project, valued at \$8.4 million over ten years, is called the Integrated Data Communications Utility (IDCU). SAIC will provide project management, systems integration, and tailored software. Its subcontractor, U.S. Sprint, will provide the network technology, customer premises equipment, transmission manufacturing, and necessary field support. Initial installation is expected to be completed within two years.

## 6. SI Organization

In general, SAIC functions on a decentralized basis. It consists of around 100 profit centers, most of which reside in seven major organizations that SAIC refers to as sectors. Skills for SI projects can be found in many of the profit centers and sectors. The major sectors are:

- Advanced Technology and Analysis Sector
- Aerospace and Defense Sector
- Military Sciences/Information Systems Sector
- Science and Engineering Sector
- Space Energy and Environment Sector
- Systems Applications Technology Sector
- Systems, Software, and Telecommunications Sector

In support of its SI strategy, as well as to expand its business base in certain niche markets, SAIC has made several acquisitions over the past few years. Current subsidiaries include:

- American Systems Engineering Corporation
- AMEX Systems, Inc.
- Bull, Inc.
- Carl T. Jones Corporation
- La Jolla Research & Business Associates, Inc.
- SAIC Architects, Inc.

SAIC has almost 2,000 employees working full-time on SI, with another 500 assigned to specific SI projects on an as-needed basis. This represents one-quarter of SAIC's total employee count of approximately

10,000. Approximately 90% of those working on SI projects support federal clients.

## 7. SI Business Objectives

SAIC identifies three objectives that guide its overall activities:

- **Technology leadership:** SAIC was founded on a base of high-technology work, and it continues to pursue this business. More than 60% of SAIC's professional staff have degrees in science or engineering, with 13% holding Ph.D.s and 34% Master's degrees.
- **Nationally significant programs:** SAIC seeks to participate in highly-visible programs that make a difference. This represents a high-risk, high-reward strategy, since one major "crater," even if it is not SAIC's fault, can have an adverse impact on the company's reputation.
- **Employee ownership and participation:** Nearly 50% of SAIC's employees own stock in the company. This encourages many employees to take a more global view of company matters, rather than focusing on individual activities.

These business objectives translate into SI objectives by emphasizing the high-technology capabilities of its personnel in solving complex customer problems. These personnel, in taking a global view and calling on extensive available in-house resources, manage the risk inherent in large SI projects.

As noted earlier, SAIC is expanding its presence in those niche markets that it has penetrated, rather than penetrating new markets. This further minimizes risk and counteracts the risks associated with undertaking nationally significant programs.

## 8. SI Capabilities Summary

SAIC has a very broad base of SI capabilities, which should make it a formidable competitor in the 1990s. Exhibits SAI-4a through 4e list key qualification areas and some notable projects in those areas. This wide range of experience and capabilities will enable SAIC to capture a greater share of the commercial SI market.

## EXHIBIT SAI-4a

**SAIC Technology Development  
and Analysis Capabilities**

- SDI simulation laboratory
- Theater missile defense architecture
- Surveillance/electro-optics technology
- Automated nuclear force planning
- Army model development/evaluation
- Submarine/antisubmarine warfare
- Nuclear weapons effects
- Seismic analysis
- Center for target studies
- Ada technology
- Artificial intelligence

## EXHIBIT SAI-4b

**SAIC Systems Development  
and Integration Capabilities**

- Command and control systems
- Aircraft training simulators
- PATRIOT tactical operations simulator
- Range training systems
- Automated munitions proving
- Cruise missile support
- Image exploitation systems
- B1-B technical support center

## EXHIBIT SAI-4c

**SAIC Technical Support  
Services Capabilities**

- Sacramento Air Logistics Center modernization program
- Meteorology engineering services
- Training systems
- Ada software engineering
- Information systems design
- Strategic air command C3 support

## EXHIBIT SAI-4d

**SAIC Energy Systems  
Integration Capabilities**

- Plant process computer upgrades
- Emergency response systems
- Utility replacement systems
- Oil pipeline control systems
- Systems engineering

## EXHIBIT SAI-4e

**SAIC Capabilities—  
Other Fields of Concentration**

- Military medical information systems
- Mainframe systems software
- NASA independent validation and verification tools
- Computer transaction security
- Automated luggage inspection systems
- Portable imaging computer
- Flight data recorder software support

## 9. Integrated SI Capabilities Evaluation

For a company that is relatively little known in the commercial environment, SAIC can bring remarkable capabilities to commercial SI projects. It counts more than 100 companies among its commercial clients, ranging (in alphabetical order) from Aerojet Corporation to Zapata Offshore Company. In most cases, these clients receive products and services other than SI. However, the clients represent an excellent base to which SAIC can sell its SI services.

SAIC has developed successful SI policies and procedures with many of its hundreds of federal clients. As a result, SAIC has become a major participant in the federal SI market. INPUT now expects SAIC to apply this expertise to the commercial market and become a major force there also.

## 10. SI Strategic Alliances

In bidding on federal SI contracts, SAIC has chosen a variety of teaming partners to suit its needs. For example, on the Composite Health Care System, SAIC chose Digital Equipment Corporation (DEC). This was an obvious choice, since most of the required applications software modules already ran on DEC equipment. For the Department of Veterans' Affairs' IDCU, SAIC chose Telenet Communications Corporation as its leading subcontractor.

However, SAIC has chosen IBM Corporation for its most strategic alliance. It has worked closely with IBM in both commercial and federal SI projects. It also has a marketing assistance program agreement with IBM and has performed systems software development for IBM for the past nine years.

INPUT expects this relationship to continue as SAIC pursues the commercial SI market. However, when it makes more sense to team with other firms, SAIC will not hesitate to do so.

## 11. SI Marketing Strategy

Currently, SAIC obtains nearly 80% of its commercial SI business from its existing client base, as opposed to only 50% of its federal SI work. INPUT expects this pattern to change gradually, as SAIC increases its pursuit of new commercial SI clients. SAIC will also emphasize those integration components in which it can realize the highest margins, including

- Customized hardware and software
- Consulting, design, and integration
- Custom software development

SAIC applies five selection criteria in deciding which projects to pursue:

- Growth programs: projects that are either large themselves or are likely to grow into large engagements
- Large value-added component: projects that involve much custom design, development, or consulting, and that will result in higher profit margins.
- Customer/program knowledge: projects that support either a current SAIC customer or involve a program already well-known to SAIC
- Similarity to previous work: projects that can be accomplished in a manner similar to other projects already completed by SAIC
- Risk: projects that, for whatever reason, represent a reduced, although not minimal, risk to SAIC

Although SAIC uses typical marketing approaches, including public seminars and direct mail, these are not especially effective. SAIC accomplishes its best marketing through client referrals and direct marketing efforts. Thus, for SAIC, good performance and current project results will yield the most beneficial marketing for the company.

## 12. SI Customer Base/Specific Projects

As indicated in Section 4, SAIC primarily supports federal clients in its SI activities. In 1989, nearly 90% of SAIC's SI revenues came from the federal market. As indicated earlier, SAIC has taken several steps to reposition itself and take advantage of commercial SI opportunities.

Sections 4 and 8 provide numerous examples of federal SI activities, as well as a few commercial activities, notably in the energy field.

## 13. Summary and Future Directions

In summary, SAIC has effectively penetrated the federal SI market, and INPUT expects SAIC to increase its role in this growing market. However, federal budget constraints and the high level of competition will inhibit SAIC's growth.

INPUT expects the greatest change to occur in the commercial SI market. Although SAIC has established a commercial presence through various specialized products and services, it is just now beginning to pursue commercial SI. SAIC will likely succeed in this market also. INPUT expects that, within three to five years, SAIC will be a much more important participant in the commercial SI market.



## COMPANY PROFILE

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### **SHL SYSTEMHOUSE INC.**

50 O'Connor Street  
5th Floor  
Ottawa, Ontario, Canada  
K1P 6L2  
(613) 236-9734

Roderick M. Bryden, Chairman and CEO  
Peter Sandiford, President and COO  
Listed on NASDAQ, Toronto Stock  
Exchange, Montreal Exchange  
Total Employees: 3,057 (1/91)  
Total Revenue, Fiscal Year End  
8/31/90: \$689,240,000 (\$ Cdn.)\*

\*All financial information is  
expressed in Canadian dollars  
unless otherwise stated

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### **The Company**

SHL Systemhouse Inc., founded in 1974, provides systems integration, professional services, and systems operations to commercial and government clients in Canada, Europe, and the U.S. The company also provides microcomputer hardware and software integration services through its ComputerLand Canada and ComputerGroup (U.K.) subsidiaries.

- ComputerLand Canada was acquired by Systemhouse in late fiscal 1988 and ComputerGroup was acquired in August 1989.
- In December 1989, Systemhouse also acquired an outsourcing data center in Houston (TX) from ITTEL Rail. Systemhouse's Johnstown (PA) data center operations have been consolidated into the Houston data center.

Kinburn Technology Corporation (KTC), a subsidiary of Kinburn Corporation, was previously the majority owner of Systemhouse. On March 12, 1990, Kinburn Corporation announced that it was unable to meet its \$700 million debt. KTC has offered its 50.1% interest in Systemhouse. As of April 1, 1991, the ownership issue is unresolved. Kinburn's stake in Systemhouse is now controlled by BCE Inc. (Northern Telecom's and Bell Canada's parent), with a 25% share, and by a syndicate of Canadian banks, with a 30% share.

Systemhouse's total fiscal 1990 revenue reached \$689.2 million, a 9% increase over fiscal 1989 revenue of \$630.8 million.

- Net losses of \$37.6 million for fiscal 1990 include unusual expenses of \$35.6 million relating primarily to a goodwill

reduction of \$20.1 million and a restructuring provision of \$4.9 million related to Systemhouse's decision to narrow its focus to specific niches within the U.S. federal government market and because of a \$9.7 million provision for accounts receivable due from Kinburn Technology Corporation and certain affiliates.

**SHL SYSTEMHOUSE INC.  
FIVE-YEAR FINANCIAL SUMMARY  
(\$ millions, Canadian)**

ITEM	FISCAL YEAR				
	8/90	8/89	8/88	8/87	8/86
Revenue	\$689.2	\$630.8	\$230.1	\$168.5	\$102.1
• Percent increase from previous year	9%	174%	37%	65%	110%
Operating revenue (a)	\$247.4	\$232.3	\$123.0	\$97.3	\$56.1
Income (loss) before taxes	\$(37.6)	\$19.2	\$7.3	\$23.9	\$10.1
• Percent increase (decrease) from previous year	(b) (296%)	163%	(69%)	137%	N/A
• Gross margin	--	3%	3%	14%	10%
Net income (loss) (c)	\$(40.6)	\$15.3	\$5.8	\$23.7	\$10.1
• Percent increase (decrease) from previous year	(365%)	164%	(76%)	135%	12%
• Net margin	--	2%	3%	14%	10%

- (a) Represents total revenue less the cost of hardware and licensed software sold.
- (b) Includes unusual charges of \$35.6 million resulting from writedowns and reductions in goodwill.
- (c) Includes credits of \$3.0 million, \$2.1 million, \$11.4 million, and \$5.2 million for fiscal 1989, 1988, 1987, and 1986, respectively, related to the recovery of unrecorded tax loss carryforwards.

Revenues over the last three years have been impacted significantly by the acquisitions of ComputerLand Canada late in fiscal 1988 and ComputerGroup at the end of fiscal 1989.

- Revenues for fiscal 1990 were lower than anticipated due primarily to a general economic slowdown in the computer industry and, in the fourth quarter, from confusion among customers surrounding the Kinburn financial difficulties.

- Revenues also reflected the conclusion of Systemhouse's two-year reduction program in its federal government business, including further steps taken in the second quarter of fiscal 1990 to limit its activities to identified strengths. Revenues from U.S. federal government business declined significantly during fiscal 1990 to \$33.3 million, from \$82.3 million in fiscal 1989, and \$66.0 million in fiscal 1988.
- Operating revenue margins were 36% in fiscal 1990, 37% in 1989, and 53% in 1988. This decrease is primarily due to the larger component of hardware in the microcomputer systems integration business which became a more significant portion of total company revenue with the acquisitions of ComputerLand Canada and Computergroup. Increased competitive pressures created by the general economic slowdown in the computer industry also had a downward pressure on margins.

Preliminary results indicated revenue for the six months ending February 28, 1991 reached \$357 million, compared to \$347 million for the same period a year ago. Net income before interest and taxes will be \$12.1 million, compared with \$5.3 million for the first half of last year.

Systemhouse has supplier agreements with many hardware and software vendors - including IBM, DEC, Sun Microsystems, and Northern Telecom.

Systemhouse has strategic alliances with ComputerLand U.S., Pansophic Systems, and Ingres (ASK Computer).

As of August 31, 1990, Systemhouse had 3,057 employees (generating \$225,463 in revenue per employee) segmented as follows:

EMPLOYEE CATEGORY	NUMBER	PERCENT OF TOTAL
Marketing and sales	520	17%
Customer support	2,221	73%
General and administrative	316	10%
<b>TOTAL</b>	<b>3,057</b>	<b>100%</b>

Systemhouse's competitors by delivery mode are as follows:

- Systems integration: EDS, CSC, and the Big Six accounting firms.

- ComputerLand Canada: Dealers such as MCW-Crowntek and smaller microcomputer and local-area network vendors. IBM is a competitor in certain markets, as are other domestic and foreign manufacturers who sell directly to the end user.

### Key Products and Services

Systemhouse management states that 100% of the company's fiscal 1990 revenue was derived from systems integration activities, of which 64% was derived from hardware and software sales (90% from hardware and 10% from packaged software), 31% from professional services, and 5% from systems operations.

Systemhouse uses a proprietary methodology, Systems Integration Life Cycle (SILC), to develop and implement all systems integration projects. SILC includes not only the software development life cycle, but also project management, strategic planning, facilities engineering, quality assurance, architecture definition, and capacity planning.

In February 1991, Systemhouse (Arlington, VA) was awarded a major systems integration contract with the U.S. Postal Service. Under the \$270 million, 11-year contract, Systemhouse will provide and operate a tracking, tracing, and inquiry service of postal mail. The base contract, which covers the first five years of the agreement, is valued at \$128 million. The succeeding two option periods are expected to total \$142 million.

- Systemhouse will design, develop, and implement software to manage and control the entire tracking and tracing application. The system includes scanning devices in 16,000 postal locations, transmitting information as the mail pieces are received at each facility. Subsequently, an 800 inquiry service will provide the status of each transaction to the customers of the Postal Service.
- Systemhouse also leads a team of companies providing expertise in various critical areas of this program, including IBM, American Airlines Direct Marketing Corporation, Symbol Technologies, Unisys, and Learning Systems International.

Other contract examples for systems integration include the following:

- Two contracts totalling \$20.7 million (U.S.) by the state of Maryland Department of Human Resources to develop and implement Maryland's Client Data Base, the Client's Automated Resource and Eligibility System, and the Child Support Enforcement System.

- A \$6 million (U.S.) contract from the Los Angeles County Superior Court to design a single system to accommodate the case management and processing needs of both criminal and civil courts.
- A \$4.2 million (U.S.) contract to provide computer systems and integration services for a new marine terminal at the Port of Los Angeles owned by NYK of Tokyo. The systems will handle terminal control, inventory, yard and vessel planning, and decision support applications in support of the management of container traffic, including in- and outbound trucks and vessels, scheduling and ship loading.
- A \$16 million contract with the Los Angeles Fire Department for its Fire Command and Control System (FCCS II). The system links IBM PS/2 workstations at 104 fire stations and Motorola KDT mobile terminals in over 400 trucks into a fault-tolerant system using Token Ring technology.
- The installation of hardware, software, and communications as part of the Naval Avionics Center's (NAC) Distributed Corporate Computing Facility. The DEC-based system uses VAX 8800s with satellite 8500s networked on an Ethernet LAN and interfacing to NAC's TCP/IP LAN. The system will assist Naval Avionics as it provides design, engineering support, prototyping, and production facilities in the acquisition of advanced electronics for U.S. Navy aircraft.

Systemhouse provides a range of services including performance analysis and system tuning, integration of vendor hardware upgrades and software releases, telecommunications network management, and contingency planning and disaster recovery. Systemhouse provides all aspects of systems operations. Contract pricing can either be fixed or transaction based. The system can be operated either at the client site or at a Systemhouse location.

Contract examples for professional services include the following:

- For Sacramento County (CA), which is one of the fastest growing regions in the U.S., Systemhouse has completed a long-range systems plan for the adoption of new countywide technologies.
- Systemhouse documented the information technology requirements for ABB British Wheelset, a Manchester-based manufacturer of railway wheels and industrial rings. The subsequent architecture definition resulted in the selection of

integrated manufacturing and accounting software in an HP 9000 hardware environment.

- For the Quebec Ministry of Environment, Systemhouse designed and later implemented a data base management system for industrial pollution sources in the province. Interfacing with other authorities, the system is designed to help enforce government regulations and reduce industrial waste.
- As part of the Information Technology Strategy development effort by the Guinness Group of Companies, Systemhouse U.K. performed an in-depth review of the Office Systems Technology. The study provided an inventory of the current office systems technologies and recommended technology solutions and implementation strategy. Using its SILC methodology, Systemhouse focused on office systems within the larger context of the total information system environment across the Guinness Group of Companies.
- Systemhouse participated in a telecommunications needs analysis and strategic plan and developed a long-range systems implementation plan for the Health Department, Province of Quebec. The study examined telecommunications and connectivity requirements for a 900-site network involving mainframes, minicomputers, and LANs. Systemhouse examined cost benefits of different commercial communications facilities, and presented a long-range implementation strategy.
- For Canadian Hunter Exploration Ltd., Systemhouse created a five-year information systems plan for the IS organization, including defining the data elements, applications, communications, and equipment.

Contract examples for systems operations include the following:

- A \$3.5 million contract with Pneumo Abex (PA) Corporation to provide processing services to three PA aerospace divisions for payroll, financial, manufacturing, and inventory processes, as well as data communications network management.
- A \$32.5 million (U.S.) subcontract with Spectrum Healthcare Solutions to provide computer hardware, systems software, communications facilities, a central data center, and ongoing systems operations services for the Hospital Financial Information System being implemented at six Los Angeles County-owned and operated hospitals.
- A \$13.9 million (U.S.), five-year subcontract from Native

American Consulting Inc. to provide data processing and network management services to the U.S. Treasury Department. Systemhouse will provide computer resources and programming support from its Houston Outsourcing Center to process all data for the Treasury Payroll Information System, which supports approximately 55,000 government employees.

- Systemhouse has assumed responsibility for operation of First City Trust Co.'s Vancouver data center. By 1992, First City will have migrated to a totally distributed operating environment for its North American offices.

ComputerLand Canada, with over 1,000 employees in 65 locations, generated revenue of \$435 million in fiscal 1990 and has grown over 300% in the last five years.

- ComputerLand Canada markets and supports third-party microcomputer hardware and software products. Support services include analysis, systems engineering, implementation, and post-installation support.
- All ComputerLand sales teams include systems engineers who have been trained as specialists on UNIX products, local and wide area networks, and proprietary and standard operating systems, as well as software and system design and network management. These engineers design and install some 3,000 local- and wide-area networks each year.
- During fiscal 1990, ComputerLand Canada also trained over 50,000 people, either at customer sites or in ComputerLand Learning Centers located in 21 cities across Canada.
- ComputerLand's Technical Services Division, with over 400 field personnel in 40 service centers across Canada, provides hardware maintenance and support services.

ComputerGroup is a leading U.K. desktop systems integrator, providing engineering, implementation, and associated support services for networked systems. ComputerGroup has approximately 480 employees and generated revenue of \$80 million in fiscal 1990.

### **Industry Markets**

Systemhouse targets the federal government, state and local government, banking/financial, medical, insurance, manufacturing, telecommunications, retail, transportation, utilities, and distribution industries.



- Ministries and departments of the Canadian Federal Government, as well as crown corporations, are the largest customers of Systemhouse, generating revenues of approximately \$44.1 million (6% of revenue) in fiscal 1990, compared to \$49.7 million (8% of revenue) in fiscal 1989, and \$21.4 million (9% of revenue) in fiscal 1988.
- Revenues from U.S. federal government clients were approximately \$33.3 million (5% of total revenue) in fiscal 1990, \$82.3 million (13% of revenue) in fiscal 1989, and \$66.0 million (29% of revenue) in fiscal 1988.

Systemhouse provides systems integration services primarily in Canada, the U.S., and Europe to government and commercial organizations.

- In Canada, Systemhouse customers come from a range of industrial, commercial, and government sectors, including financial services, resources, utilities, wholesale/retail, transportation, manufacturing, communications, and municipal, provincial, and federal government.
- In the U.S., Systemhouse customers include state and local governments, telecommunications manufacturers and services providers, and transportation, retail, and financial services organizations.
- In Europe, clients include United Nations agencies, governments, and commercial organizations.

Commercial clients include Debenham's Stores, Financial Times, Lloyds Bank, and the National Home Loan Corporation.

ComputerLand Canada and ComputerGroup's current customer base, in terms of annual dollar sales volume, is estimated as follows:

Small/Medium Business Accounts (10-500 employees)	41%
Large Business Accounts (over 500 employees)	38%
Federal, Provincial, and Municipal Governments and their agencies	8%
Education (Universities, Community Colleges, and School Boards)	3%
Other	10%
	100%



**Geographic Markets**

Approximately 74% of Systemhouse's fiscal 1990 revenue was derived from Canada, 14% from the U.S., and 12% from Europe. A three-year geographic financial summary follows:

**SHL SYSTEMHOUSE INC.  
THREE-YEAR GEOGRAPHIC FINANCIAL SUMMARY  
(\$ millions, Canadian)**

ITEM	FISCAL YEAR					
	8/90		8/89		8/88	
	\$	PERCENT OF TOTAL	\$	PERCENT OF TOTAL	\$	PERCENT OF TOTAL
Revenue						
- Canada	\$508.8	74%	\$497.6	79%	\$116.0	50%
- U.S.	94.4	14%	131.2	21%	111.3	49%
- Europe	86.1	12%	2.0	--	2.8	1%
	\$689.2	100%	\$630.8	100%	\$230.1	100%
Operating profit (a)						
- Canada	\$17.7	131%	\$41.3	102%	\$9.0	159%
- U.S.	(5.7)	(42%)	(1.2)	(3%)	(3.9)	(69%)
- Europe	1.5	11%	0.5	1%	0.6	10%
	\$13.5	100%	\$40.6	100%	\$5.7	100%

(a) Before corporate items.

Systemhouse operates Canadian branch offices located in Ontario (2), British Columbia, Alberta (2), Manitoba, Nova Scotia, Quebec, and Saskatchewan.

Systemhouse has U.S. offices located in Arlington (VA); San Francisco, Cerritos, and Sacramento (CA); Chicago (IL); Houston (TX); and Baltimore (MD).

Systemhouse has European offices in England and Switzerland.

In addition, ComputerLand Canada operates 60 Business Solution Centers in over 45 cities across Canada, and ComputerGroup owns and operates 16 ComputerLand System Centres throughout the U.K.



## COMPANY PROFILE

### STM Systems Corporation

#### 1. Key SI Contacts

Amnon Zohar  
Vice President, Central Region  
STM Systems Corp.  
393 University Avenue  
Toronto, Ontario M5G 249

Mr. James Over (Federal SI)  
Vice President, Federal Region  
STM Systems Corp.  
393 University Avenue  
Toronto, Ontario M5G 2H9

#### 2. Description of Principal Business

Formed late in 1988 by the consolidation of two companies previously acquired that year, STM Systems Corp. (STM) is a wholly owned subsidiary of International Semi-Tech Microelectronics, Inc. of Hong Kong. The company is dedicated to providing clients with total solutions for their information needs. These solutions include: systems integration; consulting, systems development, education and training, and professional services; data capture, computer output imaging, facilities management, remote computing, and network processing services; and application software products. STM has been in the federal SI business for two years and the commercial SI business for one year.

In its larger operations, STM is Canada's largest provider of IBM-based processing services, with processing centers in Ottawa, Toronto, and Mississauga in Ontario, Winnipeg in Manitoba, and Calgary in Alberta.

STM's estimated total and SI revenues for fiscal years 1988 and 1989 are presented in Exhibit STM-1.

STM Systems Corp. estimates that the growth rates in the commercial and federal SI markets are 15% and 30%, respectively.

EXHIBIT STM-1

#### STM's Estimated Fiscal 1988 and 1989 Revenues

Revenue	1988 (\$ M)	1989 (\$ M)
Total Corporate	200	210
SI Only		
Federal SI	0.5	15.5
Commercial SI	—	3.0

### 3. Competitive Position

In addition to its financial strength, STM gains its primary advantage from its proprietary systems development life cycle (SDLC) and STM project management methodologies, its strategic business planning methodology, its specialized financial and career planning support software, and its offering of microcomputer-based integrated hardware and software solutions featuring Apricot and STM microcomputers.

STM is a niche-market participant in the overall SI marketplace, offering only those products and services that it can profitably support. STM currently chooses not to offer packaged system software, custom computer or communications hardware, or follow-on services such as equipment service and repair.

STM appears to make good use of alliances. Its alliances support areas in which STM's in-house capabilities need to be enhanced and areas where in-house capabilities are strong, but need to be supplemented for a particular contract to meet delivery commitments.

### 4. Markets Served

STM is functionally oriented. It specializes in providing solutions in the following areas:

- Corporate systems
- Office automation systems
- Administrative systems
- Specific application systems

Its customer base includes both federal and commercial customers, though its major penetration to date has been with Canadian federal agencies such as National Defence, Labour Canada and Finance Canada.

### 5. Recent Events

In 1989, in a major diversification, STM's parent company acquired the Singer Sewing Machine Company (SSMC) for \$220 million, thereby also acquiring SSMC's 30,000 dealers in 100 countries.

Over the past two years, STM has completed the acquisition of several information processing and professional services companies with special expertise in health care, relational data base management, and systems integration. As a result, STM has gained strength as a competitor in the SI marketplace.

## 6. SI Organization

STM's management organization is best described as matrixed. The responsibilities for SI are fully decentralized, as is shown in Exhibit STM-2.

EXHIBIT STM-2

### Centralization/Decentralization of SI Business Functions at STM

Responsibilities	Commercial	Federal
Strategy and long-range planning	D	D
Marketing and promotion	D	D
Account management/sales	D	D
Contract review and approval	D	D
Project management/control	D	D
Implementation/development	D	D
Hardware/software acquisition	D	D
Systems operations	D	D

(D = Decentralized)

## 7. SI Business Objectives

In addition to responding to customer demands, STM identified the pursuit of revenue/profits from SI work and control of its account base as its principal motivations for engaging in SI activities. Secondary objectives were follow-on hardware/software sales and facilities management contracts, and strengthening of its non-SI business.

INPUT notes that reports in the public media suggest that James Ting, holder of the controlling interest in ISTM, Inc. (STM's parent company) is a shrewd investor who can be expected to keep STM focused on its profitability.

## 8. SI Capabilities Evaluation

STM offers SI products and services in the areas of its special expertise and in the functional markets previously identified.

STM ranked its SI capabilities as strongest in the areas of technology expertise and maintenance of its client relationships. In STM's own view, its capabilities in the areas of vertical industry expertise and risk/capacity and project management were areas of less strength. STM uses

alliances in a number of business areas, either to complement a weak area or to buttress a strong area in which delivery requirements need to be supplemented, as shown in Exhibit STM-3.

STM does not claim any capability in the areas of providing packaged system software, custom computer hardware or communications hardware, or equipment service and repair.

INPUT notes that STM is not presenting itself as a management consulting/professional services organization; rather, it is presented as a technologically based applications development and systems operations company.

EXHIBIT STM-3

### STM's SI Capabilities

SI Capability	Strength (High/Medium/Low)	Alliance (Yes/No)
Business consulting	Medium	No
Design methodology	High	No
Design/integration	High	No
Project management	Medium	No
Software development	High	Yes
Education/training/documentation	Medium	Yes
Packaged applications software	Medium	Yes
Standard computer hardware	Low	Yes
Network management/operations	High	No
Software maintenance	Low	Yes

### 9. SI Strategic Alliances

STM uses alliances on a contract-by-contract basis. STM uses its alliance partnerships to support its SI business in the following areas:

- Provision of specialized technical expertise
- Provision of off-the-shelf hardware and software
- Provision of hardware and software maintenance
- Provision of training services

A sample of STM's strategic alliances and their purposes are shown in Exhibit STM-4.

EXHIBIT STM-4

**A Sample of STM's Strategic SI Alliances**

Alliance With:	Purpose
DEC	Hardware/software maintenance/training
HP	Hardware/software maintenance/training
Unisys	Hardware/software maintenance/training
NCR	Hardware/software maintenance/training
FMCON	Tempest products services
Apricot	Distribution rights to hardware/software

**10. SI Capabilities Summary**

STM's selection of SI capabilities make it a niche player in the overall SI services market. Choosing to offer only those technological function-oriented products and services with which it can profitably compete, STM has buttressed its selected capabilities with alliances that potentially make it more responsive, rather than broadening the scope of its SI offerings.

Exhibit STM-5 summarizes INPUT's assessment of STM's SI capabilities.

EXHIBIT STM-5

**INPUT's Evaluation of STM's SI Capabilities**

Strengths	Weaknesses
Proprietary methodologies SDLC and strategic business planning Proprietary project management methodology Specific industry software Financial and career planning Complete hardware/software solutions in OA, etc.	Follow-on services Custom computer hardware

**11. SI Marketing Strategy**

STM's marketing strategy is focused on the following specific business functions: corporate systems, office automation, administrative systems,

and other application areas where specific opportunities arise. Clearly, STM has been concentrating more on the application of technology to clients' needs than on the requirements of a total vertical industry.

- Competitors - STM's competition in both commercial and federal SI markets is shown in Exhibit STM-6.
- It is interesting to note that nearly all the same vendors compete in the commercial and federal SI markets and that SI alliance partners compete within the same market also.
- Positioning - STM positions itself as a total solutions provider, offering a cradle-to-grave capability. It understands the need for life cycle support, and has the financial stability to assume the risk of a systems integrator. The corporation presents itself as having objectivity with respect to recommending and providing technological solutions. Its use of alliances increases its responsiveness rather than the scope of its capabilities.
- Promotion - STM relies most heavily on word-of-mouth client referrals. It only uses advertising in general business and trade/industry publications.

STM's total decentralization dictates that marketing of its SI services be a field responsibility. SI projects represent an attractive market for STM's services and proprietary products.

EXHIBIT STM-6

**STM's Competition in SI Markets**

Commercial Sector	Federal Sector
Andersen Consulting	Andersen Consulting
DEC	DEC
DMR	DMR
EDS	Litton Systems
IBM	SHL Systemhouse
LGS	
SHL Systemhouse	

**12. SI Customer Base**

STM, as a new entrant into the SI marketplace, has undertaken approximately half a dozen SI projects, ranging in value from an average of \$1 million in the commercial sector to \$16 million in the federal sector.



STM is pursuing increasingly larger projects with higher total project values.

Some examples of STM's SI projects and customers are presented in Exhibit STM-7.

EXHIBIT STM-7

### Examples of STM's SI Projects

Customer	Project Description	\$ Value
Finance Canada	Corporate systems network	11.1 million
Labour Canada	Integrated data system	2.3 million
Supply & Services Canada	Integrated office system	300 Thousand
National Defence	Canadian forces career information system	N/A
Multiple-Organ Retrieval Exchange	On-line organ availability system	1.3 million

### 13. Summary

STM is particularly strong in areas of technological expertise based on proprietary methodologies. Areas of strength include: SDLC, strategic business planning, and project management. Also, being an integral part of one of Canada's largest providers of IBM-oriented processing services enhances its economic strength and industry credibility.

Its weaknesses include choosing not to offer follow-on services such as equipment service and repair, or communications equipment or custom computer hardware.

It is too early to project STM's future in the SI marketplace; however, INPUT expects it to grow rapidly in its chosen markets.



## COMPANY PROFILE

## Unisys Corporation

## 1. Key SI Contacts

## Federal

H. B. Traylor  
Vice President & General Manager  
Federal Information Systems  
8008 Westpark Drive  
McLean, VA 22101

James M. Bridger  
President  
Systems Development Group  
Unisys Defense Systems  
8201 Greensboro Drive  
McLean, VA 22101

## Commercial

R. E. Johnson  
Vice President  
Systems Integration  
P.O. Box 500  
Blue Bell, PA 19421

## 2. Description of Principal Business

Unisys, the resulting combination of Sperry Corporation and Burroughs Corporation, is principally in the computer hardware, software, and services market. The company manufactures and sells a range of systems—from high-performance mainframes to microcomputer-based systems. Unisys' 1988 revenues make it the number-three vendor in the computer systems business.

Unisys, following the merger, was structured to provide better focus and direction to the company's deployment of resources and to offer products and services that fulfill the needs of the company's targeted markets. The internally issued doctrine about the merger was not that one company would absorb the other, but that elements of both companies would be retained as building blocks for a new company that would provide products and services that satisfy the needs of the market. The spirit conveyed by the chairman, W. Michael Blumenthal, was one of partnership, merit, unity, and dispatch. The partnership was one of two equals being combined. Merit was the basis for staff selection, company procedure, and extracting the disciplines to give Unisys a new and consistent direction. Dispatch was the basis for accomplishing the combination. This quick action and resolve makes Unisys a formidable competitor in all areas it chooses to pursue. Systems integration is one such area.

By almost anyone's standards the merger has been successful. With 1987 revenues in the \$9 - \$10 billion range, Unisys holds the position of being the third-largest computer hardware manufacturer. Finally, the merger has resulted in a greater focus in the information services market.

INPUT's estimate of 1987 revenues in information services is well over \$1 billion.

For 1988 Unisys reported significant revenues for its systems integration business. (See Exhibit UNI-1.)

## EXHIBIT UNI-1

**Unisys Systems  
Integration Revenues, 1988**

Business Component	\$ Millions
Federal	235
Commercial	100

### 3. Company Competitive Position

Unisys has particular strength in certain industry segments, such as banking. Emphasis is specifically on interbank networking systems (S.W.I.F.T.), document processing systems and retail distribution systems, manufacturing engineering applications, transportation (reservation, air cargo), communications (telephone billing), and state and local governments (police information, on-line management systems and court management systems).

Though each of these areas was a speciality of one of the two merger partners, the new Unisys company has taken this industry expertise and cross-trained the sales and marketing personnel to provide a more uniform approach to the competitive marketplace.

Unisys has gone on record as being equally committed to both merger partners' installed bases and hardware families of systems products. Though there is something to be gained by the sheer mass of the combination in terms of capabilities, personnel, and product experience, INPUT believes the true leverage will be accomplished in the long term through new programs that provide an opportunity to focus and leverage these disparate skill sets while new hardware/software systems are created.

Systems integration is such a program. Unisys can exploit the skill sets of the two merger partners (especially Burroughs Corporation's federal experience through its former subsidiary, Systems Development Corporation) to make the important transition to the commercial sector.

#### 4. Markets Served

Elements of Unisys have participated in the systems integration business for about 20 years. As a corporation, Unisys has a high degree of vertical market orientation. It is part of the stated strategy in systems integration to exploit the traditional lines of business where Unisys has demonstrated strength. In addition, Unisys is pursuing cross-industry opportunities, which would leverage its capability in providing integrated solutions to large network and other infrastructure opportunities. The specific targets for commercial and federal markets are listed in Exhibit UNI-2.

EXHIBIT UNI-2

#### Unisys' SI Target Market Opportunities

Commercial Targets	Federal Targets
State and Local Government	All Executive Branches
Finance and Banking	Department of Defense
Manufacturing/Distribution	Independent Agencies
Communications and Airlines	Judicial and Legislative

#### 5. Recent Events

Unisys has recently undergone a restructuring of its Complex Systems Division which combined the SI Marketing and the SI Operations organizations into a single unit under Bob Johnson. The restructuring, along with a redefinition of roles, will strengthen and clarify the SI responsibilities within Unisys. As a result of this restructuring, Unisys will most likely take a more aggressive approach to marketing in the commercial arena.

#### 6. SI Organization

Systems integration within Unisys is housed in three separate organizations. Commercial SI and the non-defense component of federal SI operations are both housed in U.S. Information Systems, under the leadership of J. M. Tucci, President. Each operates as a separate division. The federal business is conducted by the Federal Information Systems Division under the management of H. B. Traylor; the commercial activity

is the responsibility of Bob Johnson, VP of Systems Integration, Complex Systems Division. SI for the defense organizations within the federal government is handled by the Defense Systems Group, formerly Systems Development Corporation (SDC).

Both the commercial and federal non-defense SI organizations operate on a matrixed basis. However, the division of responsibilities for conducting the SI business within each organization varies. Exhibit UNI-3 compares how major responsibilities are managed within the commercial and federal organizations respectively. A "C" indicates that the responsibility for the activity in question is primarily centralized, a "D" decentralized and a "B" indicates that the responsibility is shared by both.

## EXHIBIT UNI-3

**Centralization/Decentralization  
of SI Business Function  
Unisys**

Responsibilities	Commercial	Federal
Strategy and long-range planning	C	B
Marketing and promotion	C	B
Account management/ sales	D	D
Contract review/approval	C	B
Project management/ control	C	D
Implementation/development	D	D
Hardware/software acquisition	C	D
Systems operations	N/A	D

C = Centralized, D = Decentralized, B = Both

The more centralized orientation of the Complex Systems organization reflects the need to establish strategy and processes for entering the emerging commercial marketplace. In addition to the "newness" of the market, the Complex Systems Division must deal with multiple industries and a more geographically dispersed customer/prospect set. An interesting approach has been adopted to facilitate cooperation between the existing line-of-business organizations and the recently restructured SI organization within Complex Systems. SI, under Bob Johnson, has an internal sales force focused on working with the line-of-business divisions to find, qualify, and win SI opportunities. The Federal Information Systems Division has been operating a more established business with customers and operations more cleanly focused.

#### **a. Staffing for Systems Integration**

Like most of the other SI vendors with backgrounds in computer manufacturing and marketing, Unisys operates the business with a combination of dedicated and supplemental personnel. The dedicated staff focuses on activities such as strategy, marketing, legal support, and contract and general administration of the business. In addition, the centralized organization usually houses specialized capabilities particularly applicable to systems integrations efforts, such as project managers and technical experts. The supplemental staff may come from almost anywhere in the organization and consists basically of two types of resources—those dedicated part time to SI in field positions, such as sales, and those assigned on a project-by-project basis to support implementation. Exhibit UNI-4 indicates the approximate staffing for Unisys federal and commercial SI business.

EXHIBIT UNI-4

#### **Unisys Staffing for the SI Business**

Responsibilities	Commercial	Federal
Full-time SI staff	500	2,000
Average additional assigned	Unknown	Unknown

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EXHIBIT UNI-4

#### **UNISYS STAFFING FOR THE SI BUSINESS**

Responsibilities	Commercial	Federal
Full-time SI staff	500	2,000
Average additional assigned	Unknown	Unknown



While the Complex Systems Division was unable to provide a number for the average additional staff assigned to SI efforts, it was willing to comment that the number was "substantial," leading INPUT to believe that it is probably in the 100-200 range.

As with most full-service vendors, a significant portion of the total personal committed to the SI business are in positions that directly support the implementation process. Exhibit UNI-5 gives some additional details on how the staff supporting the commercial side of Unisys' SI business is distributed.

## EXHIBIT UNI-5

**Distribution of Commercial  
SI Personnel—Unisys**

Capability	Percent
Management, strategy, planning, marketing	7
Legal/contract administration, finance	5
Project management and administration	10
Design/development/implementation	69
Hardware/software evaluation/acquisition	1
Hardware engineering	3
Sales	2
Other	3

**b. Organizational Structure**

Exhibits UNI-6 and UNI-7 show the current organizational structure for Unisys' SI organization. (See attached exhibits.)

## EXHIBIT UNI-6

## Unisys U.S. IS Organization

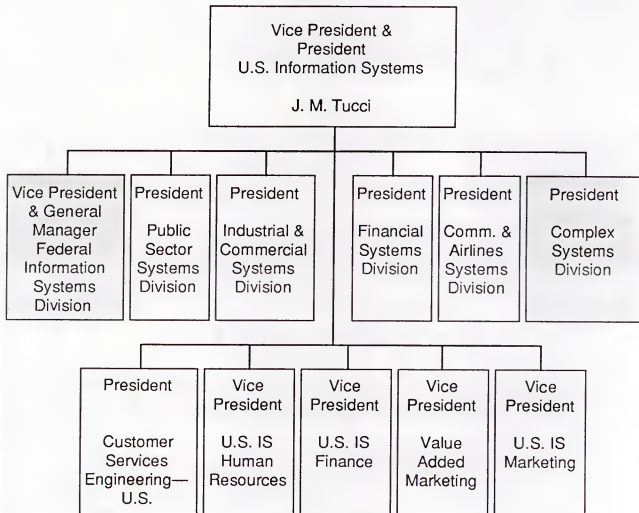
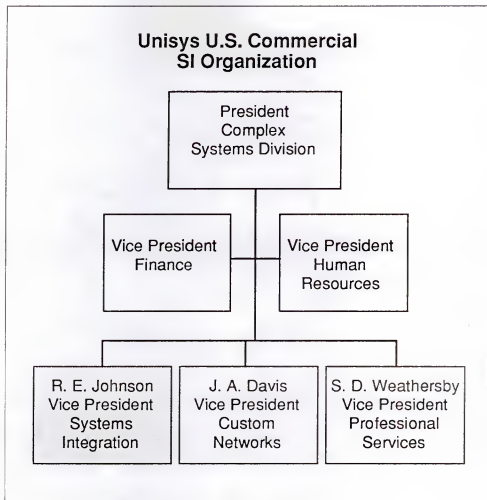


EXHIBIT UNI-7



## 7. SI Business Objectives

Stated broadly, Unisys' objectives are to maintain competitive posture with the industry leader (IBM), increase account penetration, and leverage the SI success that it has had in the federal SI marketplace.

At the time of INPUT's interviews with Unisys, the commercial and federal arms of the business appeared to have somewhat different emphases on their business objectives. Response from Federal Information Systems group indicated that the generation of profits from systems integration as a service offering, in and of itself, was a primary objective, while the Complex Systems organization indicated that this objective was secondary to the objective of being able to offer total solutions capability to customers. On the other hand there were three areas where both divisions appeared to agree. Both considered account control, follow-on hardware/software sales, and response to existing customer requirements to be primary business motivators. On a secondary level, both divisions agreed that part of their mission in the SI business was to support and strengthen the other lines of Unisys' business. Only the Federal Information Systems organization stated that potential follow-on facilities management or systems operations contracts were of any significant interest.

## 8. SI Capabilities Evaluation

Unisys has a broad base of capabilities which it brings to the systems integration business. Exhibit UNI-8 summarizes Unisys' assessment of its strengths with regard to in-house capabilities for both the commercial and federal markets. In addition, the exhibit indicates those areas where alliances are routinely used.

## EXHIBIT UNI-8

### Unisys' Assessment of SI Capabilities and Use of Alliances

Capability	Strength (High, Medium, Low)		Alliances (Yes/No)	
	Commercial	Federal	Commercial	Federal
Business consulting	Medium	Low	Yes	Yes
Design methodology	High	Medium	No	Yes
Design/integration	High	Medium	No	Yes
Project management	High	High	No	Yes
Software development	Medium	Medium	Yes	Yes
Education/training/documentation	Medium	Medium	Yes	No
Packaged application software	Medium	Medium	Yes	Yes
Packaged systems software	High	High	No	Yes
Standard computer hardware	High	High	No	Yes
Custom computer hardware	High	Medium	Yes	Yes
Communications hardware	High	Medium	Yes	Yes
Network management/operations	High	High	Yes	No
Service and repair	High	High	No	No
Software maintenance	Medium	High	Yes	No

The obvious conclusion is that to some degree Unisys' has in-house the full set of capabilities to provide, sell, and deliver systems integration projects. While Exhibit UNI-8 indicates some differences of opinion between the federal and commercial organizations on the strengths of those capabilities, there are key areas where there is general agreement.

- Neither organization indicates a significant strength in the business consulting area.

- Both organizations feel that they have solid, but not outstanding capabilities in the area of software development, training, and packaged applications software.
- Both feel that their capabilities in the project management area are superior.

INPUT believes that like most hardware vendors, Unisys is fully capable in the technical arena and has its biggest hole in the area of business consulting. Clearly, the strong vertical focus of the traditional business can provide support in that area, particularly for commercial systems integration. The question is how that capability can be married into the SI product offering and marketed convincingly to SI prospects.

### 9. SI Strategic Alliances

To some degree Unisys utilizes alliances in almost all aspects of its systems integration business. One area where alliances are seldom if ever used is service and repair. The areas where alliance are most likely to be used are in business consulting, design, packaged applications software, and custom and communications hardware. Both the federal and commercial organizations utilize long-term and contract-by-contract strategies. Long-term relationships seem to be focused on OEM hardware and software.

Unisys will incorporate products competitive to its own as part of SI proposals. The approach seems to be to analyze the customer's requirements and propose a Unisys-based solution where appropriate. In situations where a Unisys-based solution falls short, Unisys will propose solutions using other vendors' products or services. Exhibit UNI-9 summarizes Unisys' position on alliances, and Exhibit UNI-10 indicates some of the alliances that INPUT believes are or have been undertaken by Unisys on a repeat basis.

## EXHIBIT UNI-9

**Unisys Strategy—Alliances**

- Few formal long-term alliances
- Largely selected on project needs
- Utilizes competitive products/services as required
- Leverages alliance experience in federal arena

## EXHIBIT UNI-10

**Unisys Strategic Alliances**

Product	Company
Software integration/ manufacturing	DRAVO Auto Sciences
MAP protocol communications	Industrial Networking
Financial/administrative software	Customized Information Systems
Financial/accounting software	Management Sciences America
Decision support software	EXECUCOM
Terminal cluster/controllers	Air Land Systems
Communications hardware	Paradyne
Communications hardware	General Datacom

Based on Unisys' experience in networking, reservations systems, and federal government systems integration, INPUT believes there are considerable resident skills to perform the majority of likely CSI activities. For those activities that require outside resources, Unisys should have minimal difficulty in developing the necessary relationships.

## 10. SI Capabilities Summary

INPUT's evaluation of Unisys' capabilities is high. The primary weak spots appear to be in business consulting, and these can be overcome by judicious use of alliances and utilization of industry strength from the various "lines of business" organizations supporting its traditional business. In addition to the general capabilities discussed above, Unisys has a number of unique capabilities that support entry into its desired market niches, including:

- Industry-specific software for finance, manufacturing, communications, and the public sector
- Connectivity products, including network processors, timeplexing systems, and software products to support SNA, NET, and OSI
- Proprietary and alliance-provided network management products to support a variety of network architectures
- A substantial installed base, particularly in the minicomputer market

## 11. SI Marketing Strategy

Unisys has embarked on a line-of-business marketing strategy that is leveraging into the commercial SI marketplace. (See Exhibit UNI-2.) One of the difficulties that Unisys will have is having is finding qualified prospects to whom to sell SI solutions. Unisys currently uses its field sales force to find the opportunities. In both the federal and commercial SI markets, Unisys responds to RFPs and proactively develops prospects.

- Competitors: Unisys sees itself competing primarily against IBM, EDS, and Andersen Consulting, the latter primarily in the commercial market. In addition, Unisys believes that AT&T is likely to become a more formidable competitor in the near future. CSC is also a key competitor in the federal environment.
- Positioning: While there are variations between how the federal and commercial sides of house present themselves to prospects and clients, there is a certain amount of consistency. Worldwide service and support, substantial resources, full-service supplier capabilities, and compatible product architecture are promoted by both the commercial and



the federal organizations. In addition, the commercial side emphasizes its vertical market expertise, and the federal, its experience in the federal marketplace.

- Promotion: Unisys deploys virtually all methods of promotion on both sides of the business. Public seminars, direct mail, and advertising, both in general business publications and industry or trade publications, are used. However, like most other SI vendors, they find word of mouth and client referrals to be the most effective way of developing new prospects. It is interesting to note that in the commercial environment, Unisys has undertaken two avenues of promotion which it finds extremely effective—"boardroom-level" seminars and the development and implementation of specific programs to educate and utilize outside consultants.

A summary of Unisys' marketing approach is contained in Exhibit UNI-11.

EXHIBIT UNI-11

### Unisys Marketing Strategy

- Selling/prospecting through field sales
- Leverage federal government experience
- Vertical market focus for commercial marketplace
- Primary competitors: Andersen Consulting, IBM, AT&T, EDS
- Positioning: full service, full solution
- Promotion: full range, referral effective

## 12. SI Customer Base/Specific Projects

Unisys' commercial SI organization reports that it obtains about 75% of its contracts from the existing customer base and the remainder from new accounts. Interestingly, the federal organization reports the exact opposite split. Both organizations, however, report that they believe the business to be profitable.

While Unisys was reluctant to discuss the specific number of contracts currently underway or accomplished over the past two years, the commercial organization did provide several examples of recent projects:

- **United HealthCare:** To keep pace with the rapidly changing healthcare industry, United HealthCare needed a system that would enable the company and its clients to achieve maximum benefits from its large patient care data base. Moreover, it wanted to join with a strong computer systems partner in order to insure an adequate system for the future. With Unisys providing program management and development expertise, United HealthCare is upgrading its current hardware to an A17J and developing and implementing a new healthcare maintenance applications system.
- **Frederick & Nelson:** Purchased from Marshall Field and Company, Frederick & Nelson, a Northwest U.S. department store chain, needed to create a complete data processing facility from scratch, then migrate its current computer applications from Marshall Field's system to its new mainframe. Unisys' solution was a complete package, providing program management to combine hardware, custom software, customer services, facilities management, and operations management. The project was completed in June of 1988, ahead of schedule.
- **NASDAQ (National Association of Securities Dealers Automated Quotations):** Unisys' solution to providing an automated quotation system included its own Distribution Communications Processors which linked the NASDAQ broker terminal network to the Unisys 1100 systems at NASDAQ's Connecticut facility via HYPERchannel products supplied by Network Systems Corporation. The resulting network opens the market to more investors and eliminates former limitations to trading.

In upgrading NASDAQ's network architecture, Unisys redesigned the network, developed custom software to allow the various mainframe systems and communications processors to communicate via the HYPERchannel network, and provided network redundancy to support disaster recover.

Additional SI projects undertaken by Unisys are summarized in Exhibit UNI-12:

**Unisys SI Project Examples**

Company	SI Project
Ontario Hydro	Monitoring and control system
Nationwide Insurance	Agency automation for marketing complete line of insurance products
State of Washington	Social service applications
Macdermid	Manufacturing resource planning
Sunnen	Manufacturing CIM system

**13. Summary and Future Directions**

Although Unisys is a relative newcomer in the commercial SI arena, it has years of successful experience in the federal marketplace. It has considerable resources in-house to launch a successful attack on both markets and has organized to approach the market directly. As more commercial projects are completed, Unisys' portfolio of reference accounts should help it obtain a substantial footing in the marketplace. In addition there appears to be a commitment to the business that starts at the top of the organization. INPUT believes that Unisys is a solid competitor.

INPUT believes that the market will see Unisys take a more aggressive approach over the next 12 to 18 months. Marketing has been significantly strengthened, and recent reorganizations will align resources on the commercial side to mount the necessary promotional campaigns to overcome any weaknesses in the current offering.

INPUT also believes that Unisys may take a more focused approach on network and other infrastructure opportunities, in addition to pursuing its established vertical markets.

